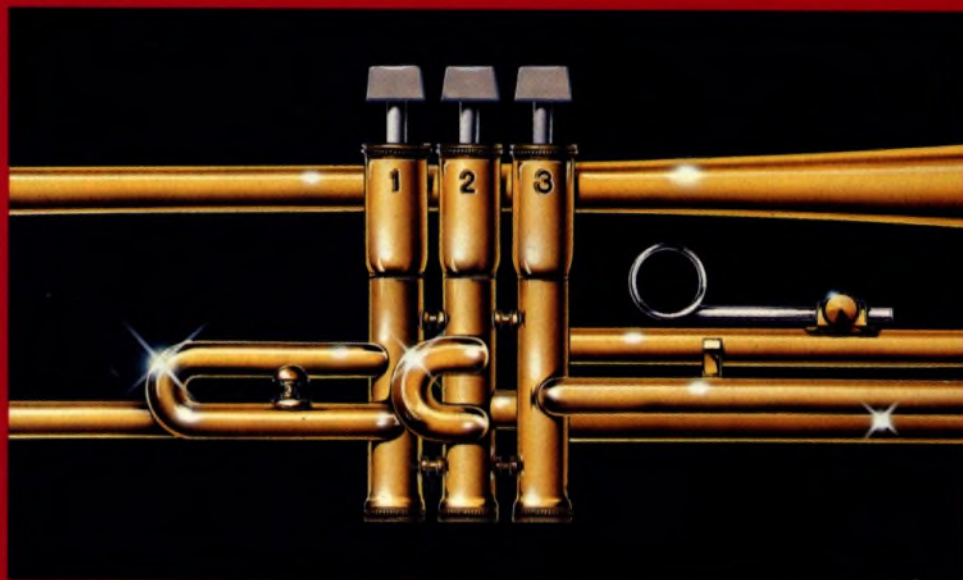
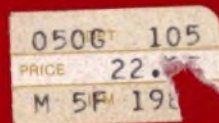




# JAZZ<sup>TM</sup>

## on the

# Macintosh<sup>TM</sup>



Joseph Caggiano/Michael McCarthy



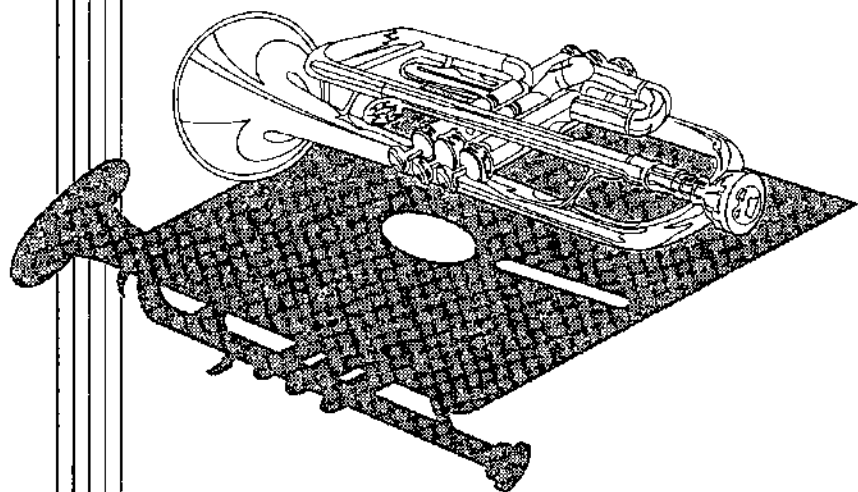
***JAZZ***

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**on the  
Macintosh**







# **JAZZ**<sup>TM</sup>

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**on the  
Macintosh**<sup>TM</sup>

**Joseph Caggiano  
Michael McCarthy**



**Berkeley • Paris • Düsseldorf • London**

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*To Kim,  
who makes it all worthwhile  
and  
Bernice, Kate, and Molly,  
three good reasons for everything*



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---

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J.C. and M.McC.  
May 1985

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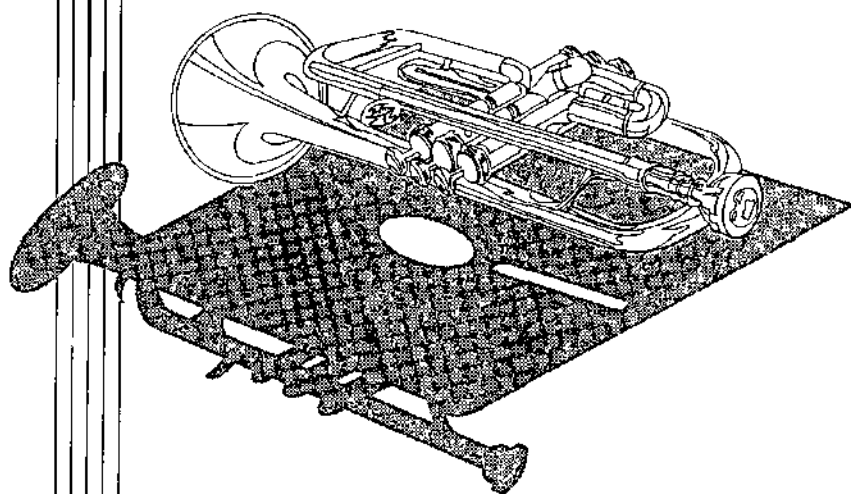
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# ***INTRODUCTION TO JAZZ***

# 1

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***T******his*** is an instruction and reference book about Jazz, the integrated software program for the Macintosh computer. Each chapter describes a Jazz module—the separate applications that make up Jazz—and how to use it.

Chapter 1 is an overview of the Jazz program. You'll learn about the five Jazz modules, their common features, and how to use them together. This chapter also shows you how to manage Jazz windows and keep things organized on the Macintosh desktop.

In Chapter 2 you'll learn how to set up and manage a Jazz database. You'll see how to organize information in a database; design forms for data entry; find the information that you want; and move it between the database and other Jazz modules.

Chapter 3 shows you how to create printed reports using information in the database. It also describes formulas and statistical functions for analyzing the database and including the results in database reports.

Chapter 4 describes the Jazz worksheet. You'll learn how to create a worksheet; make calculations; analyze results; and use worksheet values in other Jazz modules such as graphics.

In Chapter 5, Graphics, you'll see how to create graphs and charts that communicate information clearly and give your reports and presentations visual impact.

Chapter 6 shows you how to use Jazz word processing for everything from the simplest memos to elaborate documents. In this chapter, you'll also learn about the HotView feature, the special Jazz technique for updating worksheet or database information in reports and other documents.

Chapter 7, Communications, describes how to send and receive information between Jazz and other computers. You'll see how to access information banks like Dow Jones and the Source and how to set up a communications link between your Macintosh and other computers.

The appendix contains a complete list of all the keyboard commands that you can use with Jazz.

The book assumes that you're familiar with the Macintosh computer and know how to use the mouse, windows, and menus.

**The Executive Report** Chapter 8, Executive Report, shows a finished presentation created with Jazz and produced on a laser printer. We included the report so that you can see how the Jazz modules work together to complete a typical business project.

Each chapter of the book begins with a page from the executive report. Following that are instructions for creating the sample page yourself. Use the instructions as a practice exercise if you wish, or go directly on to the rest of the chapter. The main part of each chapter is independent of the sample page and can be read separately.

**Jazz Overview** Jazz combines five computer applications into one integrated program for the Macintosh computer. Created by Lotus Development Corporation, Jazz includes database, worksheet, graphics, word processor, and communications applications. Each of these applications is called a Jazz module. Since Jazz is

designed specifically for the Macintosh, each module has all the features of the Macintosh desktop: windows, pull-down menus, icons, and mouse control. The work you do in each module is stored as a document—the Jazz term for file. A letter or memo is a word processor document; a worksheet is a worksheet document; a graph is a graphics document, and so on.

**Database** A database is a collection of information organized so that you can store and find items systematically. Inventory records, the contents of a file cabinet, and a library catalog are all databases. A Jazz database can take a drawerful of records and store it all on one disk. The records are much easier to manipulate as well as more compact. The database lets you locate, update, and cross-reference data with computer speed and thoroughness. You can also analyze data and report the results, graph it, and use it in other Jazz modules. The database is much more than a storehouse—it is a valuable tool for managing information.

**Worksheet** Worksheets do for numbers what a word processor does for words. They give you freedom to enter and analyze numerical data, define and revise relationships between values, and test the effects when the numbers change. The Jazz worksheet has more than 100 predefined functions, which reduce complex calculations to a few keystrokes. A worksheet is an ideal tool for budgeting, financial modeling, forecasting, or any situation in which you work with or keep track of numbers. You can use worksheet information in other Jazz modules and print it to document relationships and results.

**Graphics** Graphics give visual impact to numbers. A trend that's hidden in a table of numbers, for example, becomes obvious when drawn as a graph. The graphics module provides several types of graphs and charts for presenting worksheet and database values. These include line and area graphs, pie charts, bar graphs, and plots, drawn individually or in combination. You also have options for labelling and calibrating graphs so that they're most effective. Jazz links each graph to its worksheet or database values. If the values change, so does the graph. This is extremely convenient—you don't have to update the graph yourself or worry about the accuracy of its values.

**Word Processor** The word processor is the space-age version of a typewriter. You'll use it to draft, edit, and polish any kind of written work. Many people find that they write more effectively with a word processor. Because it's so easy to revise your drafts, you can capture exactly what you want to say, whether in a memo or in a complex report. Jazz doesn't restrict your documents to just words. Graphics, information from the database, and results from the worksheet can all be transferred directly into the word processor. You no longer have to deal with statistical typing or trying to express in words what can be shown immediately by a graph or set of numbers.

**Communications** Jazz's communications module serves an increasingly important need in personal computing—the ability to link computers and move information between them. Communications through a modem opens many possibilities. You can send information over the telephone line from any Jazz module to another computer, or you can receive information from another computer directly into a Jazz module. So, for example, your colleague in the Seattle office can use Jazz to put together a report, then send the financial figures to one of your Jazz worksheets. It's a new way to get business or personal information across town or to the other side of the country in minutes.

The Jazz communications module also gives you access to electronic information banks and mail services. The information banks use large computers to store everything from stock quotations and news bulletins to airline schedules, classified ads, and software. You can tap into this information marketplace through the communications module. Other communications options let you set up the Macintosh as a terminal for electronic mail or to link with other computers.

**Integrated Software** The Jazz modules could stand alone in their own right, but the real power lies in their integration. This means several things:

- Menus and commands are similar in each module. When you learn the techniques in one module, you can use most of those

same techniques in the others. For example, selecting an area to work with is the same in a database, a worksheet, or a text document. A small set of common techniques gives you mastery of all the Jazz modules.

- You can use the modules simultaneously. Each module has its own window. Open as many windows as you need, then switch between them by clicking the window that you want to activate. You might, for example, find information in a Database window, click the worksheet and do some calculations, then click the word processor window and type your comments.
- You can move information between modules simply by cutting or copying it from one and pasting it to the other. So, you might copy values from a database into a worksheet, calculate their effects, and paste the results into the memo that you're writing.

The payoff of all this is that you have a complete set of tools for working efficiently with your Macintosh. You no longer have to do anything in isolation. You don't need a worksheet analysis in one program, a graph in another, and then a third program to write up the results. You can carry out the entire sequence in Jazz, without interrupting your work and with as many revisions as you wish. Jazz gives you time—to do more and to do it better. That's what personal computing is all about.

**H**ardware Requirements Jazz requires a 512K Macintosh computer equipped with an external disk drive. If you have a 128K Macintosh, you'll have to upgrade it with additional memory in order to use Jazz. The second disk drive is needed for the Jazz program disk. You can also use a hard disk instead of—or in addition to—the external 3.5-inch drive.

Jazz provides standard Macintosh format and style options for printing. The program uses the Apple Imagewriter printer without adjustment. You may need to adjust other types of printers.

Communications requires a modem such as the Apple Modem 1200 or equivalent.

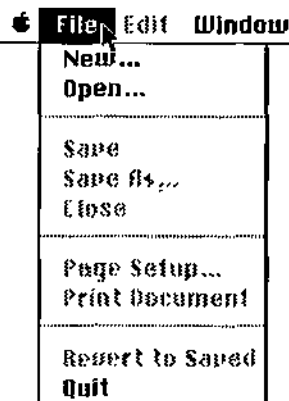
**Starting Jazz** Jazz is too large a program to fit on one disk, so Lotus provides it on two: the startup disk and the program disk. The software needed to start Jazz takes up about one-third of the startup disk. The software needed to run Jazz takes up almost the entire program disk.

Standard procedure in Jazz is to copy the startup disk and use the copies to store and work with your documents. Otherwise, you'll need to switch back and forth between the startup disk and document disks as you use the program. Having the startup portion of Jazz on document disks reduces the space available for your work, but it avoids the inconvenience of switching disks.

The program disk can't be copied. It stays in the external drive while you use Jazz.

To start Jazz, insert a copy of the startup disk in the internal drive. Then insert the program disk in the external drive. When the drives stop, double-click the Jazz icon or click to select it and choose Open from the File menu. Nothing spectacular happens at this point—Jazz just clears the desktop and displays a new menu bar. Open the File menu on this bar, as shown in Figure 1.1.

**Opening Documents** The first two commands on the File menu are New and Open. New is the first step in creating a new document. Open is the first step in opening an existing document. Here's what happens in each case.



---

Figure 1.1: The File menu.



**New Documents** Choosing New from the File menu displays the selection box shown in Figure 1.2. Each icon represents a Jazz application or module. To create a new document in one of the modules, either double-click the icon you want or click the icon and then click New. Jazz responds by opening a new document in the module that you've selected. The window and menu you see next depend on the module that you're in. At that point, start working on the new document.

**Existing Documents** Choosing Open from the File menu displays the selection box shown in Figure 1.3. Each icon again represents a Jazz application or module. This selection box also provides additional information.

The window in the center of Figure 1.3 is the document list. It shows the names of existing documents for the module. The name of the disk that you're using appears next to the document list. To switch from the document list for the drive you're using to the list for the other drive, click Drive. To eject the document disk so that you can use another one, click Eject.

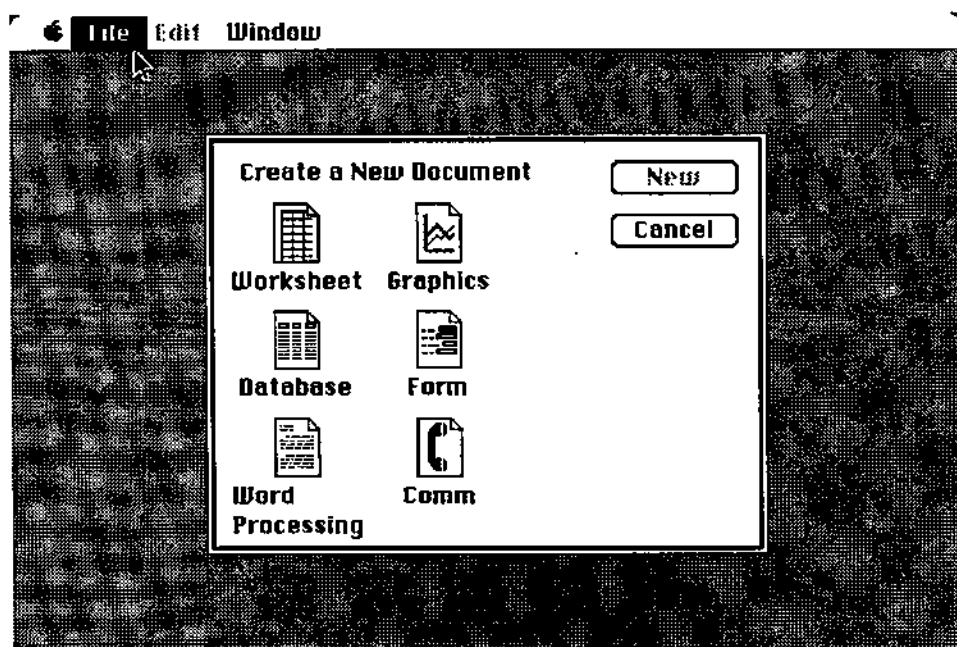


Figure 1.2: Selection box for creating a document.

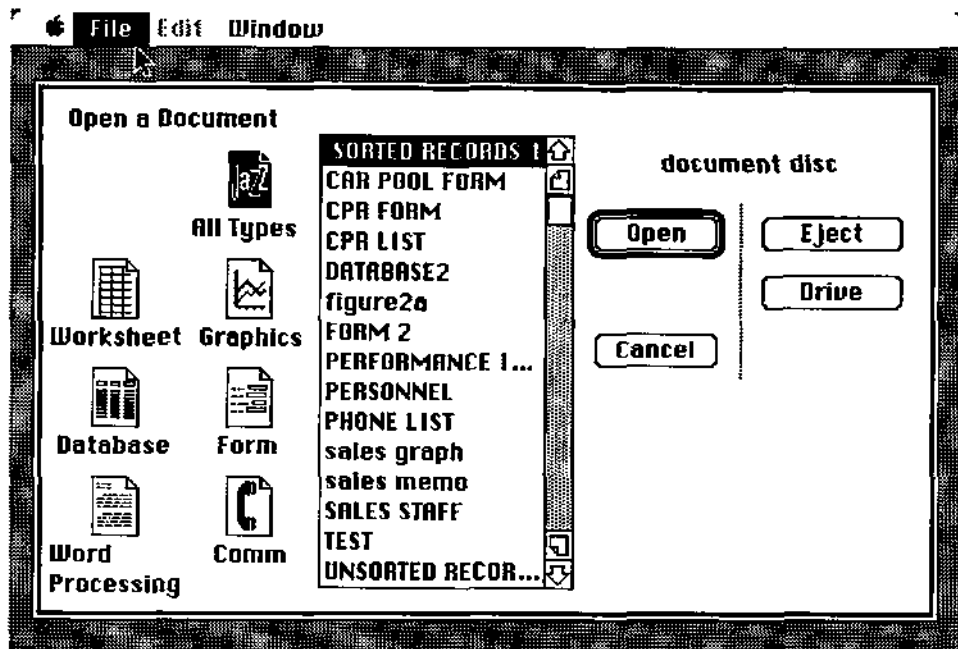


Figure 1.3: Selection box for opening an existing document.

Once you've specified a disk, you can see a list of document names for individual modules or for all Jazz documents on the disk. To see the names of all the Jazz documents, click the All Types icon shown in Figure 1.3. Use the scroll arrows or page-turning box to scan through the document list. To see the list for a particular module, click its icon and scan through the document list. A quick way to locate a document in a list is to type the first letter of the document's name. Jazz will highlight the first document in the list that begins with that letter.

Once you've found the document that you're looking for, open it either by double-clicking its name or by clicking it once and then clicking New. Jazz opens and displays the document on the screen, ready for use.

An alternate way to open an existing document is to click its icon directly on the Macintosh desktop. Jazz opens the document, and you can immediately begin working on it.

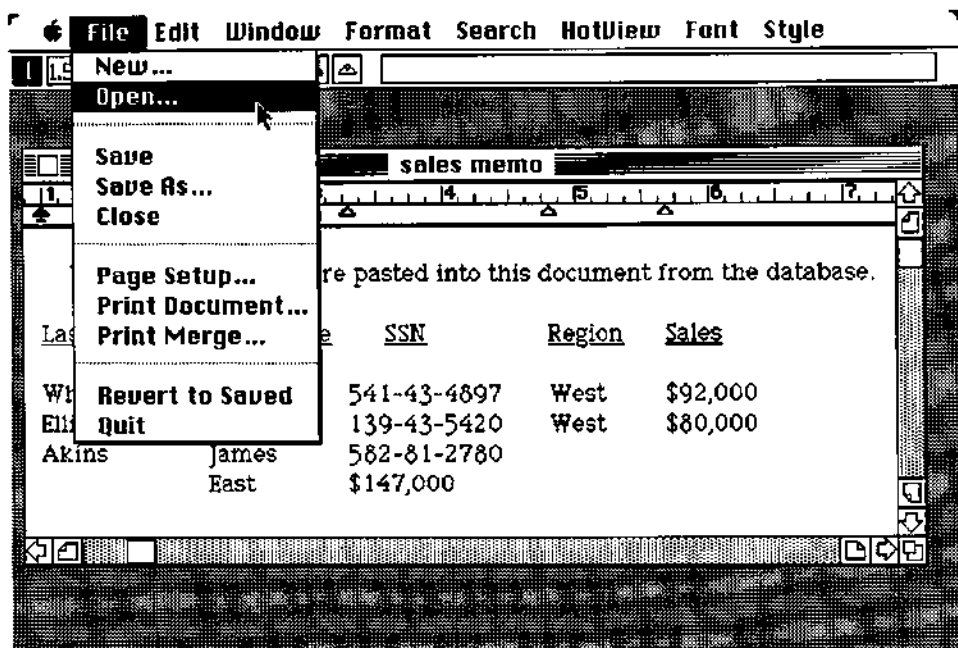


Figure 1.4: Use the File menu to open other documents while working in a module.

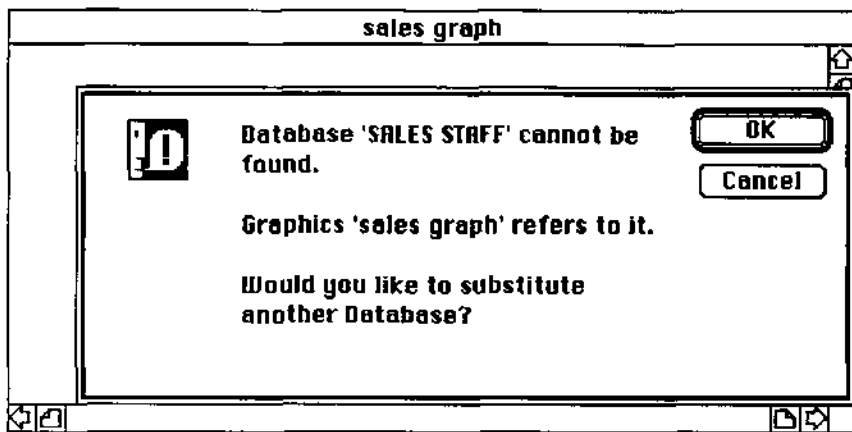
**Opening Documents While Using a Module** One of the key features of Jazz is that you can work with several documents simultaneously. That means that you can create and open documents not just when you're starting the program, but also while you're using a module. The technique for creating a new document or opening an existing one is the same, whether you've just started the program or are already using a module.

For example, while using the word processor to write the memo in Figure 1.4, we decided we need to open the database. We choose Open from the File menu, click the Database icon in the selection box to list database documents, then find and open the database that we're interested in. Jazz opens the database and makes it the active window on top of the memo. We can switch between the memo and database by clicking their windows. Creating a new document follows a similar sequence, except that it starts by choosing New, rather than Open, from the File menu.

**Linked Documents** One thing to note when opening and when saving documents is the link Jazz creates between certain documents. Graphs, for example, depend on values in a worksheet or database. Forms are linked to databases. In Jazz terminology, forms and graphs are dependent documents. When you open a dependent document, Jazz checks the disk for the document to which it's linked. If both documents are on the same disk, there's no problem in opening the dependent one. However, as Figure 1.5 shows, there is a problem when linked documents are not on the same disk. In this case the graph named Sales Graph depends on a database called Sales Staff.

When we opened Sales Graph, Jazz checked the disk for the Sales Staff database, but didn't find it. Figure 1.5 gives us two choices. We can choose OK, use another database to open the Sales Graph—in which case the graph will change, if it can be drawn at all. Or we can choose Cancel, open the graph anyway—in which case there won't be any data on the graph. In either event, we won't get the graph that we wanted. There's a simple way to avoid problems like this: save linked documents on the same disk.

**Saving Documents** Until you save it, the work that you do is stored only in your Macintosh's memory, not on disk. Unfortunately, if your electrical power is cut off or interrupted, everything in memory—including the work that you haven't saved—is erased. To minimize the loss should this happen, save your work often while using Jazz.



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Figure 1.5: Typical message when linked documents are not on the same disk.

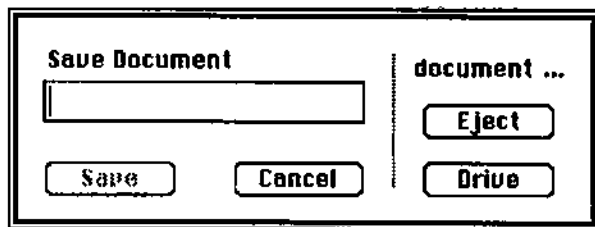
The File menu has standard Macintosh commands for saving documents. The first one, **Save**, makes a disk copy of the document that you're working in and leaves the document open so that you can continue using it. When you first **Save** a document, you'll see the dialog box for naming it, as in Figure 1.6. Type a name that makes sense to you and isn't longer than 20 characters. Use standard techniques to edit the name and the drive selector to specify a disk other than the current one. Subsequently, use **Save** only to update the disk copy of the document without changing the drive or the name.

Figure 1.6 is also the dialog box for the **Save As** command. Use **Save As** to name and save a document for the first time; change the name of a document; make disk copies under several names; or copy the document to different disks. **Save As** is designed for changing the document name or disk drive, not for updating disk copies. In fact, it won't work unless you do make such a change. Instead, you'll see a "document in use" message. If this happens, and all you want to do is update the disk copy, cancel **Save As** and use **Save** instead.

There are two things to note about saving Jazz documents:

- **Save linked documents** (graphs and worksheets, forms and databases) on the same disk. This prevents problems when you open the dependent document.
- The **Revert to Saved** command discards anything you've done in a document since last saving it. This is convenient when you want to abandon recent changes to a document and start again with the latest version on disk.

The **Close** and **Quit** commands act in the usual way. **Close** closes the active window. **Quit** closes all open windows and brings you back to the Macintosh desktop. In each case, you have a chance to save any work not already on disk.

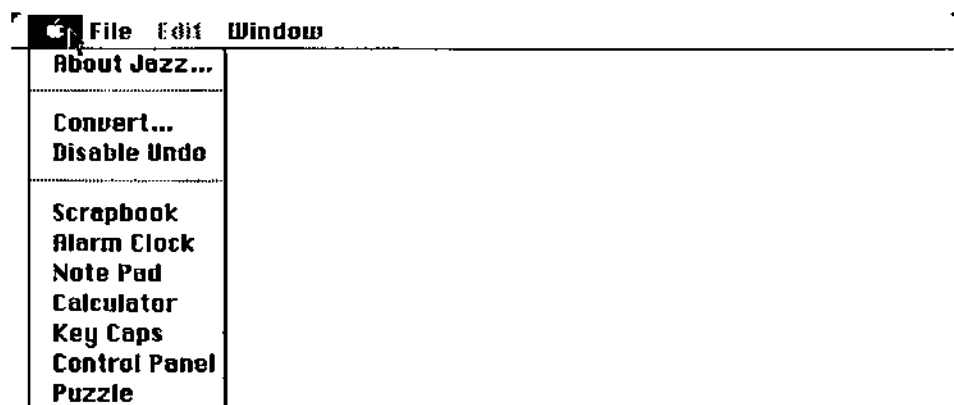


**Figure 1.6:** Saving a document.

**C**ommands and Menus Jazz menus list commands available at any point. Use standard Macintosh techniques to give commands. You either pull down a menu and choose the command from it or, for commands that have a keyboard equivalent, hold down the Command key [ ⌘ ] and type the appropriate letter. Some commands are common to all Jazz modules; others are available only in the module that you're using. Here we'll describe some of the common commands and general things to keep in mind when using any Jazz application. For details about menus in specific modules, see the other chapters of this book.

**Apple Menu** The Apple menu, shown in Figure 1.7, is the same in all Jazz modules. It includes standard Macintosh desktop accessories plus two commands unique to Jazz: About Jazz and Convert.

**About Jazz** About Jazz, the first command on the Apple menu, displays the program's version number and shows how much memory is available for your work. Jazz itself occupies about half (256K) of the Macintosh's memory, leaving the rest available as work space for your documents. In addition to storing the program and documents in use, Jazz needs memory space to carry out commands and



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**Figure 1.7:** The Apple menu.

provide features like HotViews, document links, and type styles. With so much to keep track of, its memory can get a bit crowded.

When working with large documents or using many windows at the same time, it's a good idea to check memory occasionally. You'll see how much is still available and the proportion in use. This is a good way to avoid getting an "insufficient memory" message when you try to do something. Several techniques economize memory use and increase the amount available:

- Eliminate empty space in worksheets and databases. Remove blank cells from worksheets and blank records from databases.
- In text, use a single type size and style rather than a combination of sizes and styles.
- Close windows that aren't in use.
- As a last alternative, disable the Undo command.

The volume and kind of work that you do determine memory use. Incorporating conservation techniques into your work style will prevent or minimize memory problems.

**Convert** Convert copies worksheet files from Lotus 1-2-3, Symphony, or Microsoft SYLK format into Jazz worksheets. This gives you access to work done with these very popular programs. You can copy such files directly from a Macintosh disk or receive them through the Jazz communications module. Jazz preserves most of the original file's format settings and all its essential data, such as cell values, formulas, cell protection, calculation and sort orders, and table definitions. However, Convert doesn't preserve 1-2-3 or Symphony macros.

Choosing Convert from the Apple menu displays the dialog box shown in Figure 1.8. The dialog box shows the current disk and lists the worksheet files on it that can be converted. If necessary, click the drive selector to switch disks. Figure 1.8 has one worksheet, Unsorted Rep, that can be converted.

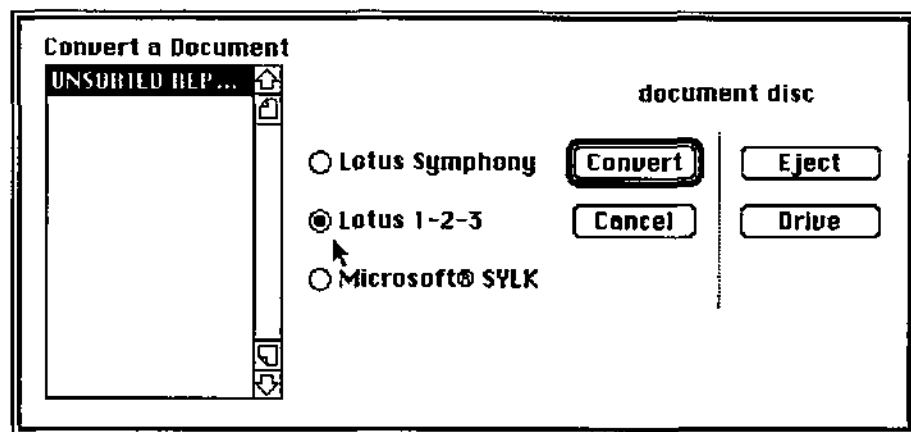
To convert a file, click its name and file type—Symphony, 1-2-3, or SYLK—then click Convert. After converting the file, rename and save it using the Save As dialog box. If the file is in a format that can't be converted, you'll see a message box instead of a Save As dialog box.

To work with the converted file, now renamed as a Jazz worksheet document, choose Open from the File menu. You can then use the converted data as a Jazz document.

Convert is a technique for moving information from other programs to Jazz. To move data between Jazz documents, use the standard Macintosh Copy, Cut, and Paste commands, or use the HotView feature, which is described in Chapter 6. The other chapters of this book describe how to move data between specific modules.

**Disable Undo** In all Jazz modules, it's possible to undo commands like Cut, Copy, Paste, and Clear by immediately choosing Undo from the Edit menu. Undo reverses the previous action and restores the document to what it had been. Choosing Disable Undo from the Apple menu eliminates this safety feature. The advantage is that Jazz carries out commands faster and uses less memory. The disadvantage is that you can't change your mind and restore things with Undo. At least initially, it's advisable not to disable Undo. If you do disable it, you can turn it back on by choosing Enable Undo from the Apple menu.

**Managing Windows** Windows are your Macintosh's on-screen work areas. Whenever you create or use a Jazz document, you work in a window belonging to one of the Jazz modules. All Jazz windows have some elements in common: a menu bar, a



---

Figure 1.8: Convert copies files from other programs to a Jazz worksheet.



title bar, console areas, scroll arrows, page-turning boxes, and size boxes. All menu bars include the Apple, File, Window, Font, and Style menus. Standard Macintosh techniques (selecting, scrolling, dragging, etc.) work in all Jazz windows.

Apart from the common elements, windows look a bit different from module to module. The menu bar has additional menus specific to the module. The console areas have different icons and entry boxes. The work area may be blank, as in the word processor, or have a gridwork of lines, as in the database and worksheet. Figure 1.9 shows windows for three Jazz modules: the word processor, worksheet, and graphics.

As usual with the Macintosh, the window that you're using at any point is called the active window. You can recognize the active window by the horizontal lines that run across its title bar. Several windows—from the same module or from different modules—may be open simultaneously, but only one window is active. Since the active window is placed on top of the other open windows, it's sometimes easy to lose track of what's on the desktop. One solution is to adjust the size of different windows so that you can see at least part of each as you work. Jazz also offers another solution. Open

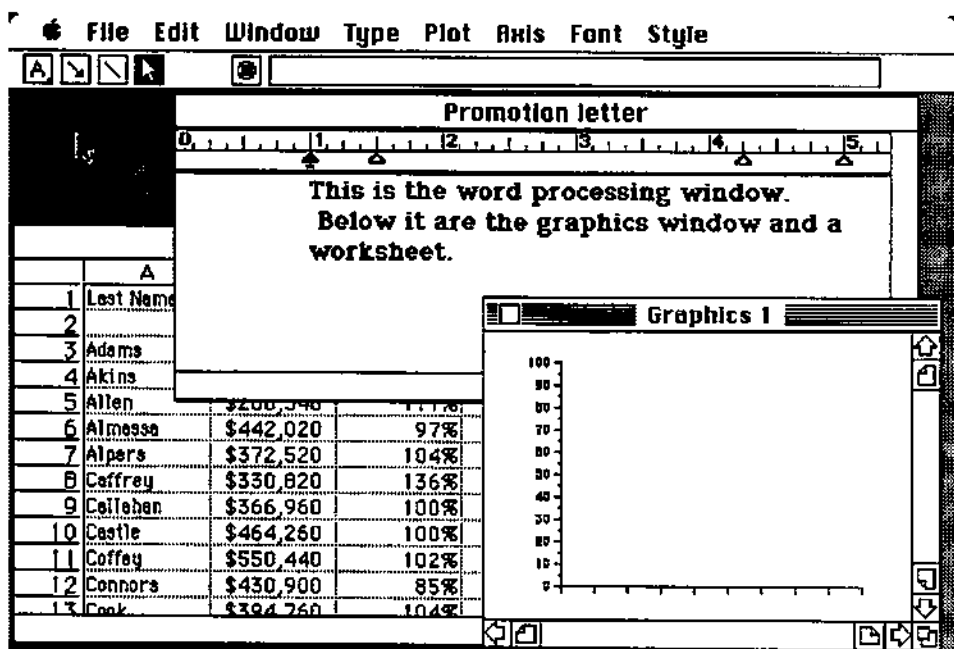


Figure 1.9: Each module has a different window.

documents are always listed at the bottom of the Window menu, as shown in Figure 1.10. You can check this menu to see which windows are on the desktop, then make a window active by clicking it or choosing its name from the list.

The Window menu has two additional commands which you may not have seen before on a Macintosh. Zoom Up enlarges the active window to fill the screen completely. This command alternates on the menu with Zoom Down, which reduces the window to its previous size. The Reference Board helps keep track of the documents that you're using. Choosing this command opens a window that shows the name of the previously active document and—for a worksheet or database—any range or field name selected.

**S**ummary Jazz is an integrated program for the Macintosh world. It combines five standard applications into a single program with uniform commands, windows, and work sequences. Jazz modules include word processing, worksheet, database, graphics, and communications. Integration means you can use the modules simultaneously and move data between them as needed. Information in a database, for example, can be used for worksheet analysis, graphed, incorporated in a report, and sent to another computer—simply by switching from one Jazz window to another.

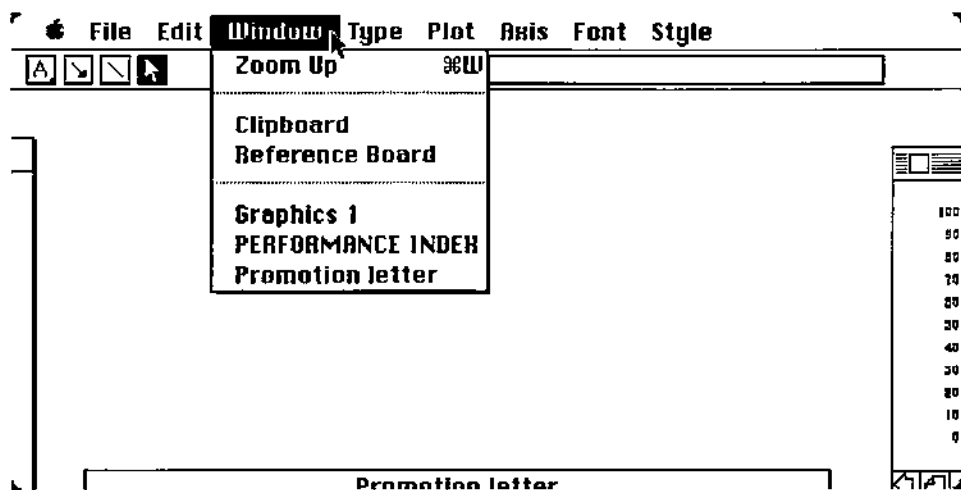
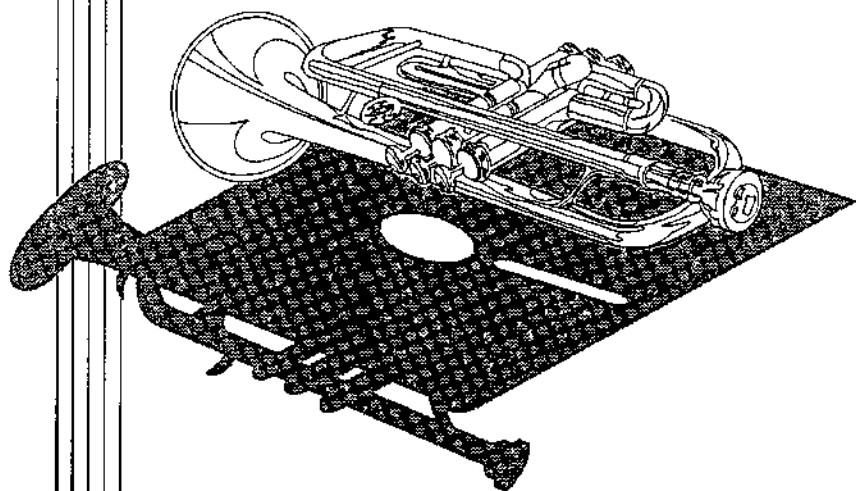


Figure 1.10: The Window menu.

Capitalizing on the Macintosh's ease of use, Jazz incorporates all the elements of the Macintosh desktop: pull-down menus, windows, icons, and mouse control. The merger of an advanced computer and effective software makes a streamlined system for modern business.



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# ***DATABASE***

# 2

**INTRODUCTION** Database is a new word for a familiar idea. A library catalog, the file cabinets in an office, and a set of index cards are all databases. They store information in a systematic way so you can review and update it.

The Jazz database is similar to any set of records. But the whole thing is stored on disk instead of paper—which gives you an information system that's fast and compact. This chapter describes the Jazz database module. You'll learn how to organize and manage a database, find information, and create forms for data entry. You'll also learn how to move information between the database and other Jazz modules such as the word processor and the worksheet.

We've divided this chapter into sections according to the tasks involved in using a database. The first section includes the fundamentals of setting up a database and putting information in it. The Forms section shows you how to create and use forms for data entry. The section on Managing the Database describes how to locate and manipulate information in the database.

# EXECUTIVE REPORT

## DATABASE SAMPLE PAGE

## APPENDIX B

## (A) WIDGECO SALES STAFF

|    | Last Name   | First Name | SSN         | Region      | Sales     |
|----|-------------|------------|-------------|-------------|-----------|
| 1  | Adams       | Samuel     | 689-75-1730 | Pacific     | \$173,000 |
| 2  | Akins       | James      | 582-81-2780 | East        | \$147,000 |
| 3  | Allen       | Thomas     | 293-31-0209 | West        | \$103,000 |
| 4  | Almassa     | Robert     | 577-10-9647 | Europe      | \$159,000 |
| 5  | Alpers      | Nancy      | 452-67-3050 | West        | \$134,000 |
| 6  | Caffrey (D) | Paula (C)  | 594-01-9252 | Central (C) | \$119,000 |
| 7  | Callahan    | MaryEllen  | 925-66-3813 | West        | \$132,000 |
| 8  | Castle      | Robert     | 927-01-5595 | Central     | \$167,000 |
| 9  | Coffey      | Eleanor    | 770-46-5329 | East        | \$198,000 |
| 10 | Connors     | Elizabeth  | 793-64-2819 | Central     | \$155,000 |
| 11 | Cook        | Patrick    | 787-23-0845 | Central     | \$142,000 |
| 12 | Dixon       | Ronald     | 814-52-2641 | West        | \$154,000 |
| 13 | East        | Deborah    | 638-92-1038 | Europe      | \$196,000 |
| 14 | Elliot      | Harry      | 371-14-1693 | West        | \$90,000  |
| 15 | Ellis       | Paul       | 139-43-5420 | West        | \$80,000  |
| 16 | Fogarty     | John       | 610-15-2073 | Europe      | \$77,000  |
| 17 | Ford        | Franklin   | 563-84-2709 | East        | \$98,000  |
| 18 | Franklin    | Julius     | 220-75-8345 | Central     | \$103,000 |
| 19 | Freud       | Lawrence   | 512-81-9277 | West        | \$120,000 |
| 20 | Garfield    | Thomas     | 689-15-7806 | Europe      | \$154,000 |
| 21 | Geraldi     | Anthony    | 443-52-8902 | East        | \$191,000 |
| 22 | Glenn       | Edward     | 871-55-1872 | West        | \$133,000 |
| 23 | Goode       | Eugene     | 551-68-7436 | Pacific     | \$124,000 |
| 24 | Griffon     | Harold     | 752-86-1593 | West        | \$137,000 |
| 25 | Harrison    | Benjamin   | 431-69-4035 | East        | \$105,000 |
| 26 | Henderson   | Janet      | 391-45-0257 | Central     | \$105,000 |
| 27 | Jackson     | Ellen      | 262-60-7734 | East        | \$193,000 |
| 28 | Jefferson   | Carla      | 663-92-4091 | East        | \$128,000 |
| 29 | Keller      | Jennifer   | 428-51-3760 | Pacific     | \$128,000 |
| 30 | Lin         | Katherine  | 935-38-6303 | Pacific     | \$176,000 |
| 31 | Lynch       | Ellen      | 364-91-2240 | East        | \$98,000  |
| 32 | Maggiore    | Leonard    | 542-75-5193 | Europe      | \$135,000 |
| 33 | Marques     | George     | 343-26-4819 | Central     | \$167,000 |
| 34 | Martin      | Vera       | 255-31-6051 | Central     | \$139,000 |
| 35 | Minh        | Lee        | 457-49-0844 | Pacific     | \$150,000 |
| 36 | Mitchell    | Carl       | 861-57-1535 | West        | \$175,000 |
| 37 | Monaldez    | Frank      | 167-30-0865 | Central     | \$113,000 |
| 38 | Moore       | Dorothy    | 529-41-1173 | West        | \$201,000 |

## **K** **EY TO THE SAMPLE PAGE**

---

The list on the facing page is taken from the executive report in Chapter 8. It shows people who will attend Widgeco Inc.'s annual sales conference. This information was collected in a database, then sorted and printed for inclusion in the report.

- Ⓐ The header shows that this page is part of the sales conference material. Headers can be specified with the Page Setup command on the File menu or with the Show Definition command on the Report menu.
- Ⓑ Each column in the database is headed by a field name. Fields classify database information by categories such as last name and first name. The sample list also includes fields for social security number (SSN) and sales region.
- Ⓒ The individual entries in each column are field values, the smallest units of information in the database.
- Ⓓ The numbered lines are database records that identify each person on the list. Each record is made up of four field values: Last Name, First Name, SSN, and Region. The records were sorted in alphabetical order before printing.
- Ⓔ The footer identifies the report date.

Footers can be specified with the Page Setup command on the File menu or with the Show Definition command on the Report menu.

## **C**REATING THE SAMPLE PAGE

Before the annual sales conference, WidgeCo Inc.'s Marketing Vice President prepares a report for distribution to management. The report summarizes recent performance and pinpoints the company's successes as well as areas that need attention. In this part of the chapter, we describe how the database is used to develop the report.

**S**et Up the Database Initially, we want to consolidate some basic information about the sales staff. At the minimum, we need names, social security numbers, and sales regions, plus each person's sales figures for the past year. WidgeCo also ranks its sales staff by a performance index, the ratio of actual sales to targeted goals. Since we need five categories of information, we'll define five fields in the database.

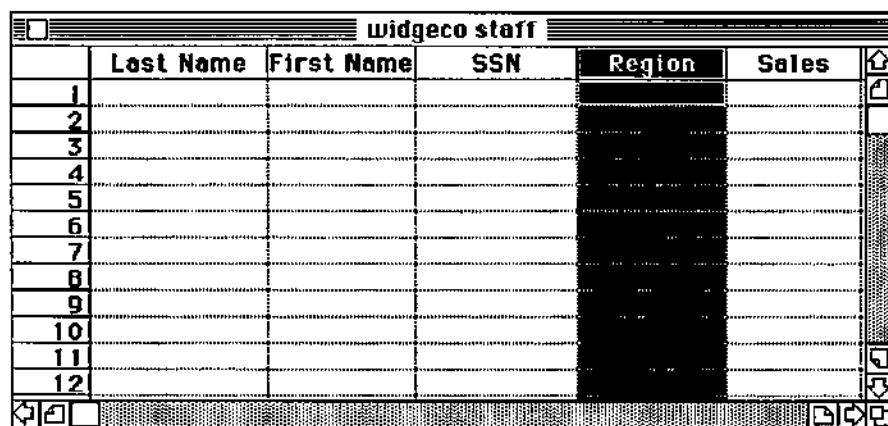
Start by choosing New from the File menu, then double-click the Database icon to open a new database. Use the Field Attributes box to define each field name in turn and set display widths. Define the fields as follows:

|         |            |                |    |            |
|---------|------------|----------------|----|------------|
| Field 1 | Last Name  | Display width: | 12 | characters |
| Field 2 | First Name | "              | 10 | "          |
| Field 3 | SSN        | "              | 11 | "          |
| Field 4 | Region     | "              | 9  | "          |
| Field 5 | Sales      | "              | 9  | "          |
| Field 6 | Index      | "              | 8  | "          |

After defining the fields, click Done in the Field Attributes box, then add several blank records to the database, as shown in Figure 2R.1.

**D**ata Entry There are two ways to enter information into the database at this point: type it directly in the Database window or use a form. We'll use a form because it simplifies things if we decide to delegate data entry to someone else. The person can use the form alone without ever seeing the database.

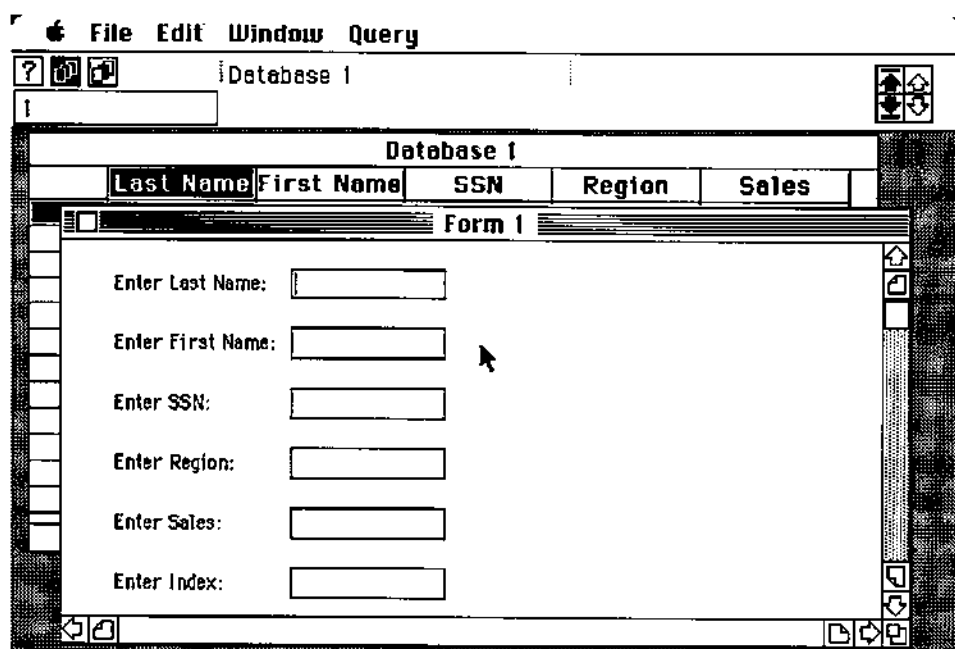




|    | Last Name | First Name | SSN | Region | Sales |
|----|-----------|------------|-----|--------|-------|
| 1  |           |            |     |        |       |
| 2  |           |            |     |        |       |
| 3  |           |            |     |        |       |
| 4  |           |            |     |        |       |
| 5  |           |            |     |        |       |
| 6  |           |            |     |        |       |
| 7  |           |            |     |        |       |
| 8  |           |            |     |        |       |
| 9  |           |            |     |        |       |
| 10 |           |            |     |        |       |
| 11 |           |            |     |        |       |
| 12 |           |            |     |        |       |

Figure 2R.1: New database.

Choose New from the File menu, then double-click the Form icon to open a Form window. As shown in Figure 2R.2, the form already has correct field names when it opens.



Database 1

Form 1

Enter Last Name:

Enter First Name:

Enter SSN:

Enter Region:

Enter Sales:

Enter Index:

Figure 2R.2: The form for the new database.

The form is linked to the database and can be used as is for data entry. But to make it easier for other people to use, we'll redesign the form slightly. Choose **Modify Form** from the **Edit** menu. Use the mouse to rearrange message boxes on the form, and use the notation well to add labels and instructions. Figure 2R.3 is a redesigned version of Figure 2R.2. When you're satisfied with the result, choose **Use Form** from the **Edit** menu.

For this example, the easiest way to build up the database is to copy some of the information from the sample page. Fill in several blank forms for different sales people on the list. Notice that the list doesn't have any sales or index data. For the moment, leave these fields blank on each record. After you enter several records in the database, click the Database window to make it active.

**S**orting Records We can enter records into the database in any order, then rearrange them as needed with the **Sort** command. For the report, we want the records listed alphabetically by last name. Choose **Set Fields** from the **Sort** menu. As the first sort field, type **Last Name** and specify ascending sort order (i.e., from A to Z). Leave the other sort fields blank. Use the **Sort** command to rearrange the database.

widgeco form

WIDGECO INC.

Marketing Dept.

Sales Staff Record

Confidential

Type Last Name:

Type First Name:

Type SSN:

Type Region:

Type Sales:  286-1

Type Index:

Figure 2R.3: Redesigned data entry form.

**C**opying Data from the Worksheet At this point, we've entered only four field values for each record: Last Name, First Name, SSN, and Region. Values for the other fields, Sales and Index, already exist on the Jazz worksheet shown in Figure 2R.4. Instead of retyping the values in the database, it's much easier to copy them directly from the worksheet. This way, we save time and avoid data entry errors.

Start by selecting the worksheet area containing sales and index values. Copy it to the Clipboard, then activate the Database window. Select the Sales and Index fields in the database, then paste the values from the worksheet. Figure 2R.5 shows the result—the database records completed with values from the worksheet.

**P**rinting the Records The database now contains all the information needed for the sample page. We can print the sample page as a database report (described in Chapter 3) or use the File menu simply to print a list of records.

Choose Page Setup from the File Menu to open the Print dialog box. Specify the paper, type the header and footer for the sample page, and set one-inch margins. Choose Hide Grid from the Style menu and 12 point from the Font menu.

| PERFORMANCE INDEX |           |              |                   |   |   |   |
|-------------------|-----------|--------------|-------------------|---|---|---|
|                   | A         | B            | C                 | D | E | F |
| 1                 | Last Name | Actual sales | Performance Index |   |   |   |
| 2                 |           |              |                   |   |   |   |
| 3                 | Adams     | \$480,940    | 102%              |   |   |   |
| 4                 | Akins     | \$408,660    | 100%              |   |   |   |
| 5                 | Allen     | \$286,340    | 111%              |   |   |   |
| 6                 | Almessa   | \$442,020    | 97%               |   |   |   |
| 7                 | Alpers    | \$372,520    | 104%              |   |   |   |
| 8                 | Caffrey   | \$330,820    | 136%              |   |   |   |
| 9                 | Callahan  | \$556,960    | 100%              |   |   |   |
| 10                | Castle    | \$464,260    | 100%              |   |   |   |
| 11                | Coffey    | \$550,440    | 102%              |   |   |   |
| 12                | Connors   | \$430,900    | 85%               |   |   |   |
| 13                | Cook      | \$394,760    | 104%              |   |   |   |

Figure 2R.4: Worksheet values needed in the database.

| PERSONNEL |            |             |         |        |       |
|-----------|------------|-------------|---------|--------|-------|
|           | First Name | SSN         | Region  | Sales  | Index |
| 1         | Samuel     | 689-75-1730 | Pacific | 480940 | 1.02  |
| 2         | Thomas     | 689-15-7806 | Europe  | 428120 | 1.03  |
| 3         | Robert     | 577-10-9547 | Europe  | 442020 | 0.97  |
| 4         | Nancy      | 452-67-3050 | West    | 372520 | 1.04  |
| 5         | Paula      | 594-01-9252 | Central | 330820 | 1.06  |
| 6         | MaryEllen  | 925-66-3813 | West    | 356960 | 1     |
| 7         | Robert     | 927-01-5595 | Central | 464260 | 1     |
| 8         | Eleanor    | 770-46-5329 | East    | 550440 | 1.02  |
| 9         | Elizabeth  | 793-64-2819 | Central | 430900 | 0.85  |
| 10        | Patrick    | 787-23-0845 | Central | 394760 | 1.04  |
| 11        | Ronald     | 814-52-2641 | West    | 426120 | 1.18  |
| 12        | Deborah    | 638-92-1038 | Europe  | 544880 | 0.93  |
| 13        | Harry      | 371-14-1693 | West    | 250200 | 1.09  |

Figure 2R.5: Copy values directly from worksheet to database.

We want to print only the first four fields for each record, not the Sales or Index fields. To select the fields, drag across the field names at the top of the Database window. To print the records with the selected fields, choose Print Selection from the File menu, set the print quality, and click OK.



## **P**reparing a Database

**What Is a Database?** In modern business, information is almost as important as money. Names, addresses, prices, inventory and market data, personnel records, financial data—think of all the information that competes for a manager's attention.

What makes information valuable? It has to be timely, correct, and relevant to your work. It also has to be organized so that you can get the information that you need, in a useful form, when you need it.

That's where a database comes in. A database is a systematic way to record and organize information. We've all dealt with databases, knowingly or not. The stock market page of your newspaper is a database that's updated each day. When you look up a number in the telephone directory, you're using the telephone company's database. When you register your car, you provide information for a database maintained by the motor vehicles department.

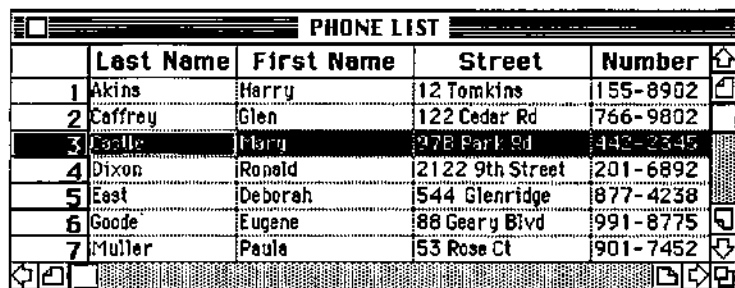
Organization is the key to these databases and any others. Your purpose for maintaining a database determines how you organize and keep information in it. In Jazz, you decide the purpose and build a database accordingly.

**Database Structure** Think of the telephone directory. It's a systematic structure, not a collection of random information. Each entry in the directory has specific items of information: name, address, and telephone number. The database allows space for just these items in each entry—no more, no less. The database term for information categories like name, address, and telephone number is field.

Figure 2.1 shows the database equivalent of a telephone directory with four fields: last name, first name, street address, and telephone number.

You can look at Figure 2.1 as a grid of horizontal rows and vertical columns. Each column is headed by a field name. The individual entries in each column—names, addresses, and numbers—are field values.

Reading from left to right, each row in the grid starts with a number and includes a set of field values. In database terminology, a complete set of field values—any horizontal row in the grid—is



|   | Last Name | First Name | Street          | Number   |
|---|-----------|------------|-----------------|----------|
| 1 | Akins     | Harry      | 12 Tomkins      | 155-8902 |
| 2 | Caffrey   | Glen       | 122 Cedar Rd    | 766-9802 |
| 3 | Castle    | Harry      | 278 Park Rd     | 442-2345 |
| 4 | Dixon     | Ronald     | 2122 9th Street | 201-6892 |
| 5 | East      | Deborah    | 544 Glenridge   | 877-4238 |
| 6 | Goode     | Eugene     | 88 Geary Blvd   | 991-8775 |
| 7 | Muller    | Paula      | 53 Rose Ct      | 901-7452 |

**Figure 2.1:** Telephone directory.

called a record. Mary Castle's record, for example, consists of her last name, first name, street address, and telephone number.

Any database consists of information classified into fields and organized into records. Building a database means defining fields, then adding specific information to create records. The payoff for organizing information this way is the power you have to manipulate, review, and report it.

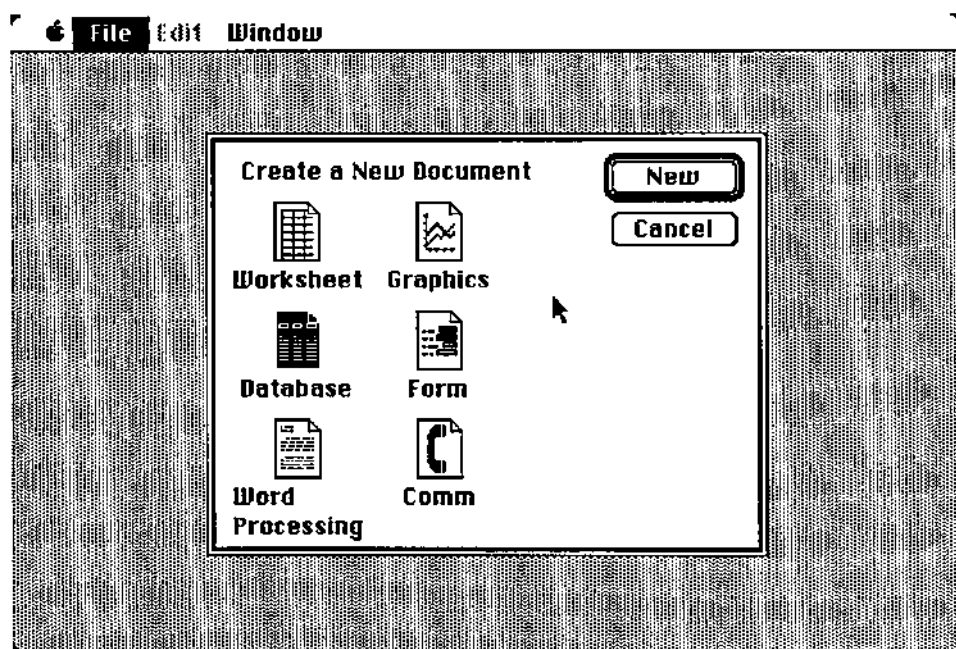
**Setting Up a Database** Setting up a database involves several steps:

1. Open the database.
2. Define its field names and attributes.
3. Add records.

Figure 2.2 shows the Jazz file display, which is the starting point for building a new database.

To open a new database, double-click the Database icon or select it and click New. Jazz responds by opening the Field Attributes box, shown in Figure 2.3.

Setting up a database is always a matter of organization. Once you've opened a database, the next step is to define the fields you want in it. For example, the sample page at the beginning of this chapter provides fields for name, social security number, sales region, and so on.



**Figure 2.2:** Jazz File display.

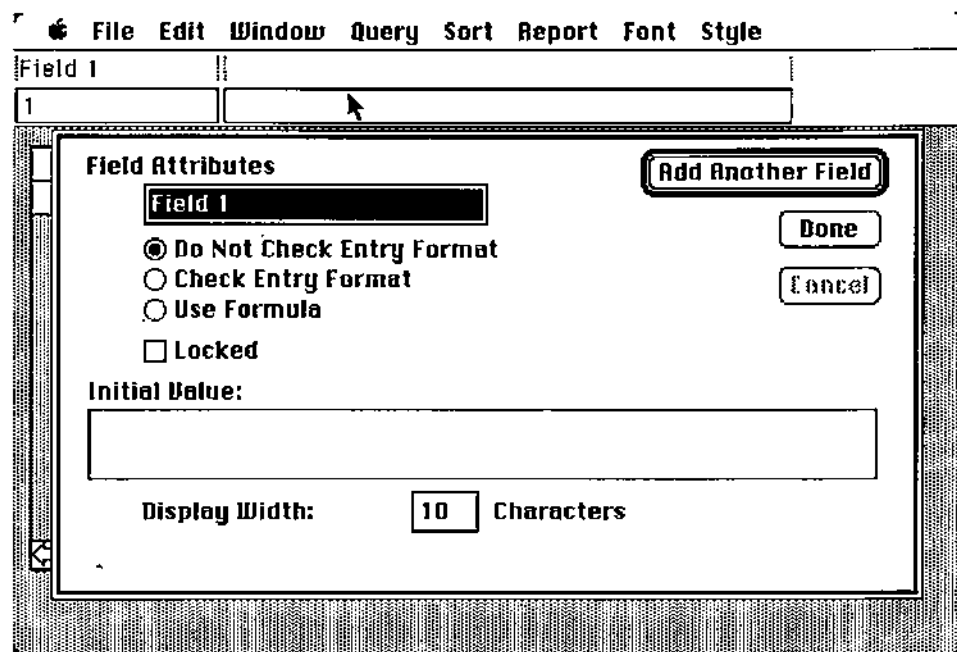
Each field has certain characteristics that are part of its definition. These include field name; field width, or maximum number of characters allowed in each field value; and format (decimal, dollar-and-cent, percent, etc.). You use the Field Attributes box to define these characteristics, or attributes, when setting up the database. If you need to, you can always change them later.

Figure 2.3 also shows the database menu bar above the Field Attributes box.



This menu bar indicates that a database is open. But the menus themselves aren't available until you define at least one field in the database. Put another way, the database isn't real until you give it a structure.

**Field Attributes** The first item in the Field Attributes box is a highlighted area for typing field names. In a new database, this area



**Figure 2.3:** *Field Attributes box.*

is always labeled Field 1, Field 2, Field 3, etc., the name Jazz uses until you type a replacement. In an existing database, this area will show an actual field name.

**Field Name** To define a field name, type it in the highlighted area. In Figure 2.4, we've replaced Field 1 with **Last Name**.

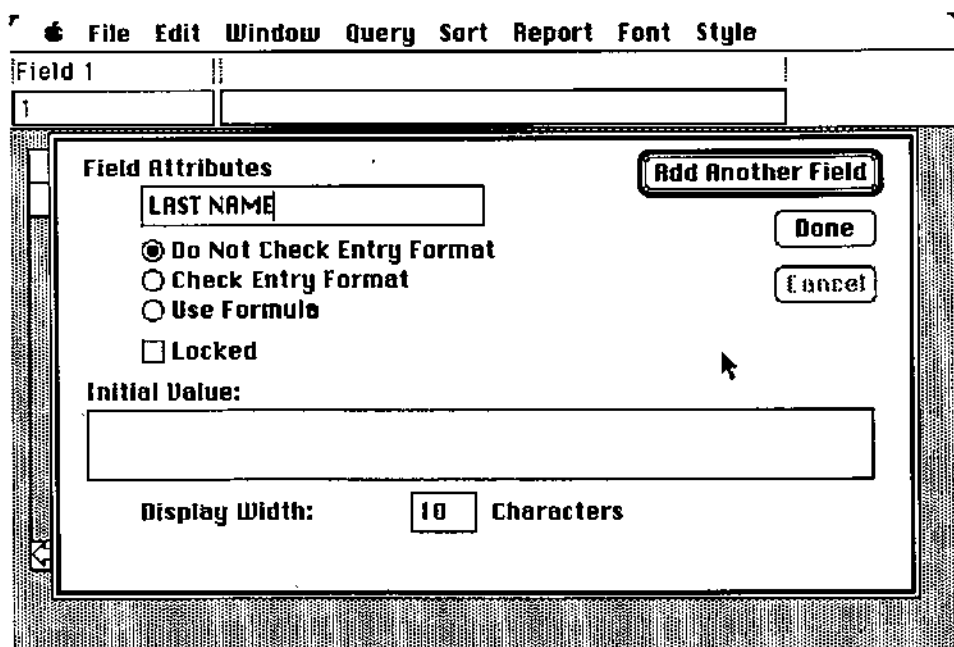
Use standard Macintosh techniques to edit field names. You can correct errors by dragging across them and retyping or by erasing them with the Backspace key.

In the database, each field name will appear at the top of a column in which you'll type specific field values. The information you intend to keep in the database determines what the field names will be.

Defining field names is very straightforward and involves only two rules:

- Always start with a letter, then use letters, numbers, or spaces as you wish.
- The maximum length for a field name is 15 characters.





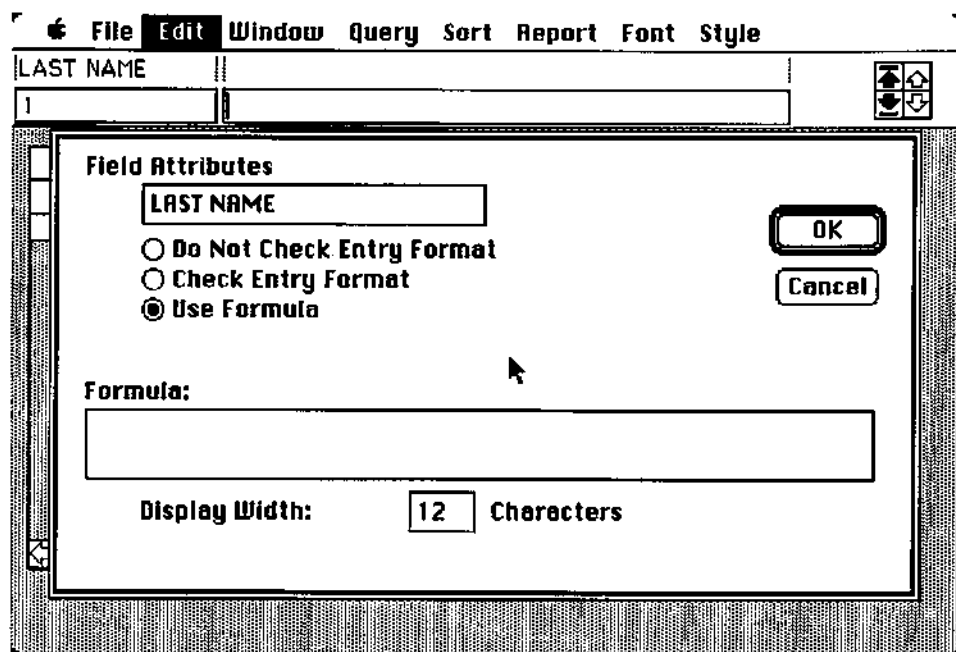
**Figure 2.4:** Last Name replaces Field 1.

Remember that databases are built from small pieces of information. Each field classifies information into the smallest possible component. A person's full name, for example, is divided into two fields: last name and first name. An address is broken into four components—street, city, state, and ZIP code—each of which is a separate field.

**Display Width** Once you've defined a field name, you need to specify the maximum length for entries in the field. In a new database, Jazz automatically allows ten characters per field. Change this to any number between 3 and 254 as needed for the field. Social security numbers, for example, need a display width of at least 11 characters.

To set the display width, double-click the box next to Characters and type the new number. Use standard Macintosh techniques to change the number as needed.

Figure 2.5 shows the display width set to 12 characters for the Last Name field.



**Figure 2.5:** Character width.

A field name and display width are required parts of any field definition. You must define both these attributes when creating a field.

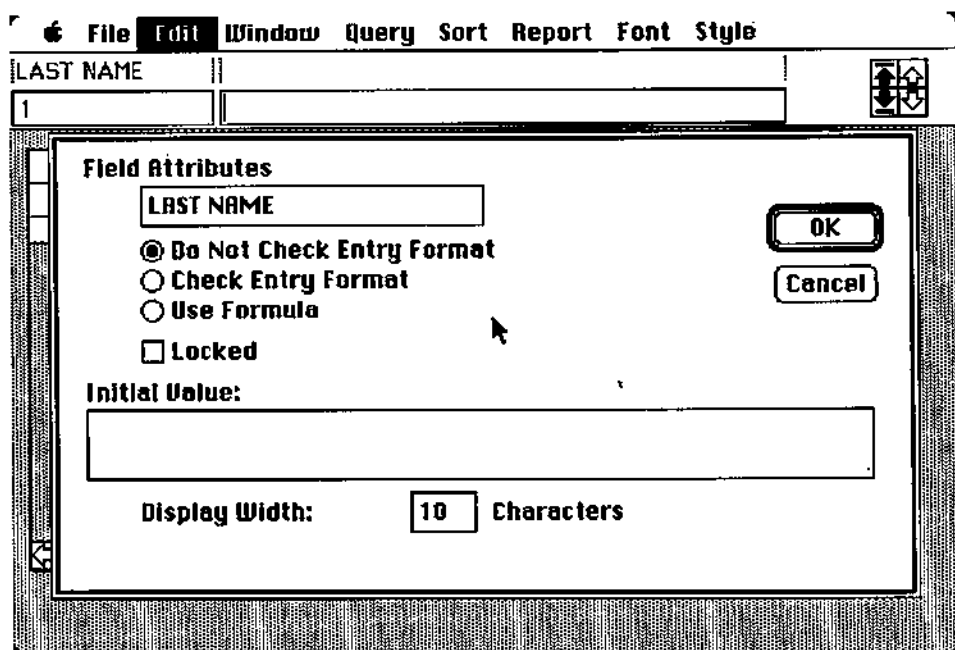
The Field Attributes box also includes several options that you can choose to make field definitions more precise and to restrict the information that can be entered in a particular field.

**Field Restrictions** The Field Attributes box includes options for checking the entries that can be made in the field. These are listed in the Field Attributes box under the field name.

Figure 2.6 lists three ways to restrict the data that can be entered in a field:

- Check the entry format
- Use a formula
- Lock the field

**Check Entry Format** refers to the type of data you'll include in a particular field. Jazz provides four formats: text, numeric, time, and date.



**Figure 2.6:** Field restrictions.

The text format affects the alignment of letters and numbers in the columns of the database. The numeric format has six options: fixed, scientific, currency, percent, comma, and general. These determine how numbers appear in the database.

The time and date formats specify how time and date entries will appear. Time, for example, can be shown as AM and PM or in 24-hour format. Several date formats are available, including Month/Day/Year and Month/Year.

The Field Attributes box isn't used to specify any of these formats—you only use it to choose whether or not entries should be checked against them. (To specify formats, you use the Edit menu.) Checking entry format for a given field means that Jazz will only accept data that conform to the format you've specified. This prevents someone from entering numbers, for example, in a field that you've reserved for text. It's one way to minimize errors during data entry.

Not checking entry format means that the information won't be screened for format as it's added to the database.

To make either choice, click the button next to the option in the Field Attributes box.

Clicking the **Use Formula** selection adds a "Formula" area to the Field Attributes box, as shown in Figure 2.7.

Formula refers to an interesting capability of the Jazz database. Jazz will calculate field values based on other entries in the database and a formula you define in the Field Attributes box.

Suppose for example, a database included fields named **Cost** and **Units** for a line of products. You want to find the **Cost per Unit** and include it as a third field. Figure 2.8 shows how to define the new field.

The Field Attributes box includes the field name and a formula for calculating the field value. Were you to enter values for Cost and Units in this particular database, Jazz would calculate the Costs per Unit value and add it to the database.

Figure 2.8 also shows that the **Use Formula** option has been selected. This ensures that only calculated values will be accepted in the Costs per Unit field.

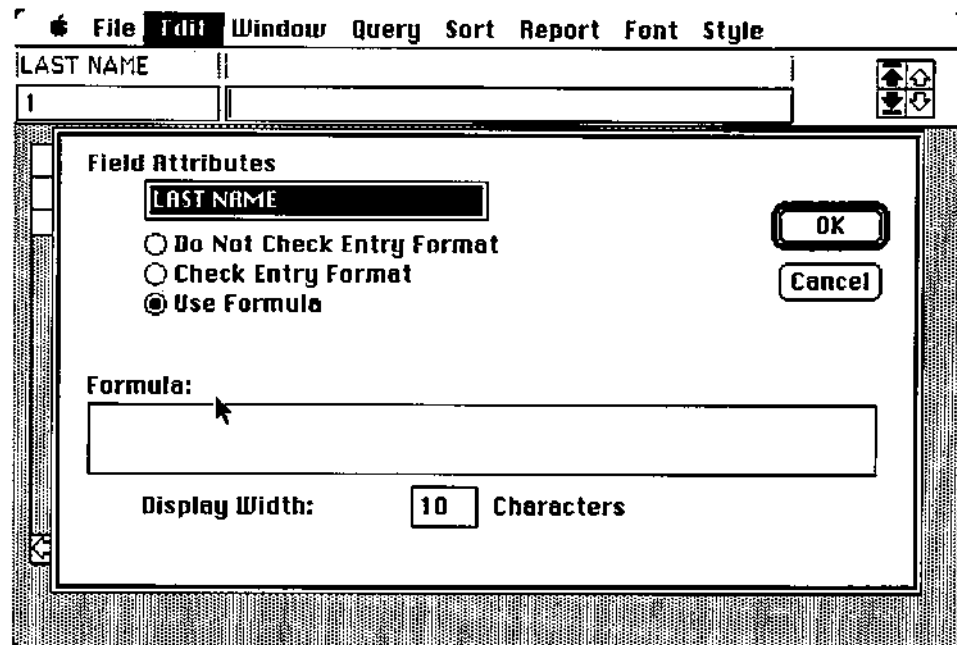


Figure 2.7: Formula option.

Selecting the **Locked** option will lock that field. In a new database, locking a field prevents data from being added to it. Locking a field in an existing database prevents any changes to the data in it. This provides some measure of security against loss of data or errors being introduced into the database.

To lock a field, click the box next to the Locked option in the Field Attributes box, as in Figure 2.9. To unlock it at any point, click the box again.

**Initial Value** Initial Value is the last of the options in the Field Attributes box. An initial value is information—text, numbers, date, or time—that remains constant for all the records in the database. Typing an initial value once when defining a field repeats the value for every record that includes the field.

If, for example, you're compiling a database of customers in Chicago, you could define a **City** field as in Figure 2.10. When adding information to the database, you wouldn't need to type Chicago for each record. It would already be there.

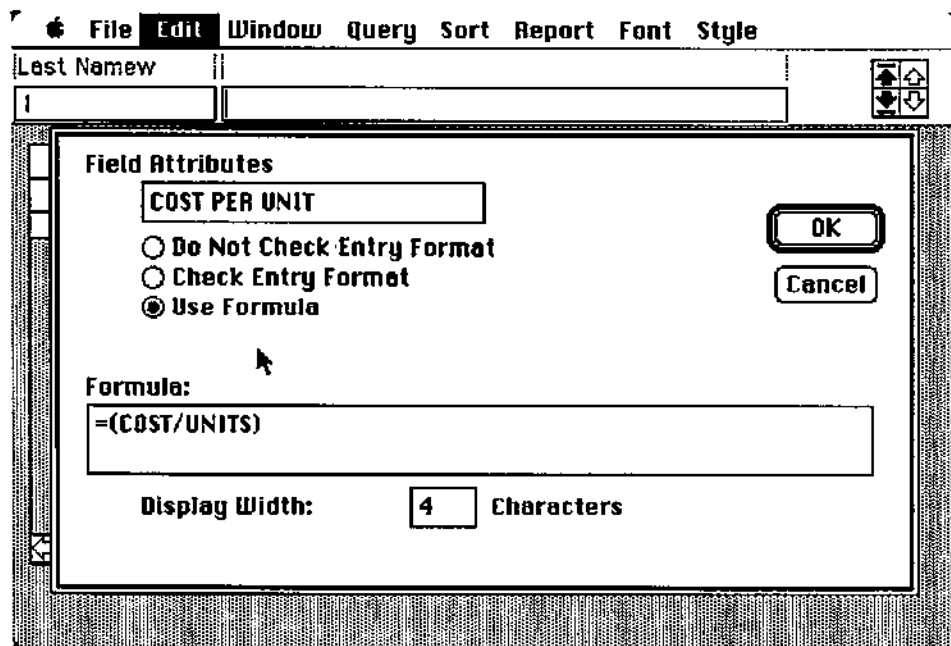


Figure 2.8: A calculated field.

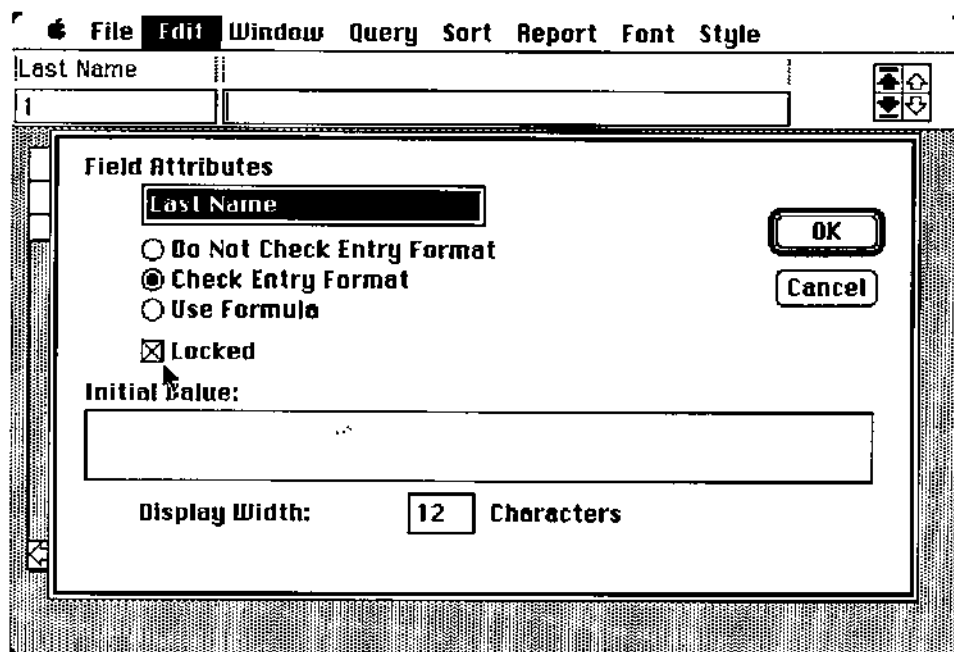


Figure 2.9: Locked field.

**Completing the Field Definition** The Field Attributes box gives you considerable leeway in defining database fields. The simplest field definition includes only a field name and display width. More elaborate definitions can include whatever options are useful to you.

In any case, none of the field definitions made when you set up a database is irrevocable. Once a database is established, you can change field attributes as needed by selecting **Field Attributes** from the Edit menu, as in Figure 2.11.

The Field Attributes box displays several choices after you've completed the field definition, depending on whether you're setting up a new database or working with an existing one:

- **Add Another Field.** This choice adds the field you've defined to the database and brings up a new Field Attributes box. To define another field, specify its attributes. Continue this sequence until you've defined all the fields for the database.
- **Done.** Make this selection after you've defined all the fields for the database. This selection closes the Field Attributes box and

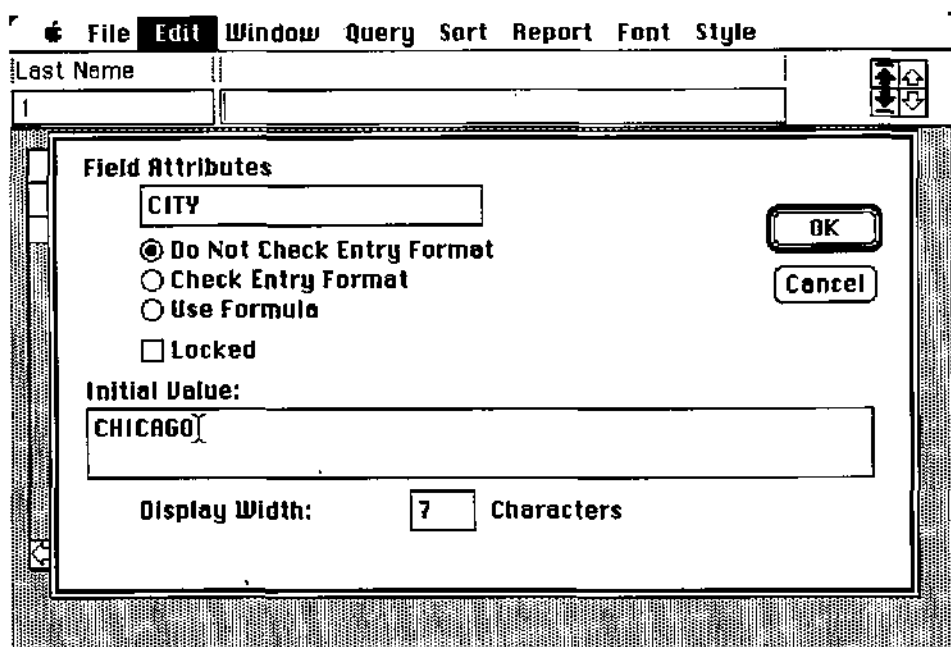


Figure 2.10: The Initial Value is constant for all records.

leaves the Database window on the screen. You can begin adding information to the new database at this point.

- **Cancel.** This option is available for existing databases or after you've defined one field for a new database. It erases the field definition you're working on and switches from the Field Attributes box to the Database window.
- **OK.** After reviewing a field definition or defining a new field for an existing database, choose **OK** to add the field to the database and return to the Database window.

When you make one of these choices, Jazz will create the database and name it Database 1, Database 2, Database 3, etc. These names remain in effect until you rename the database when saving it for the first time.

The Field Attributes box is the entry point for setting up a new database or modifying field definitions in an existing database. By defining fields with the Field Attributes box, you establish the database structure, or the rules about what goes into the database. Field

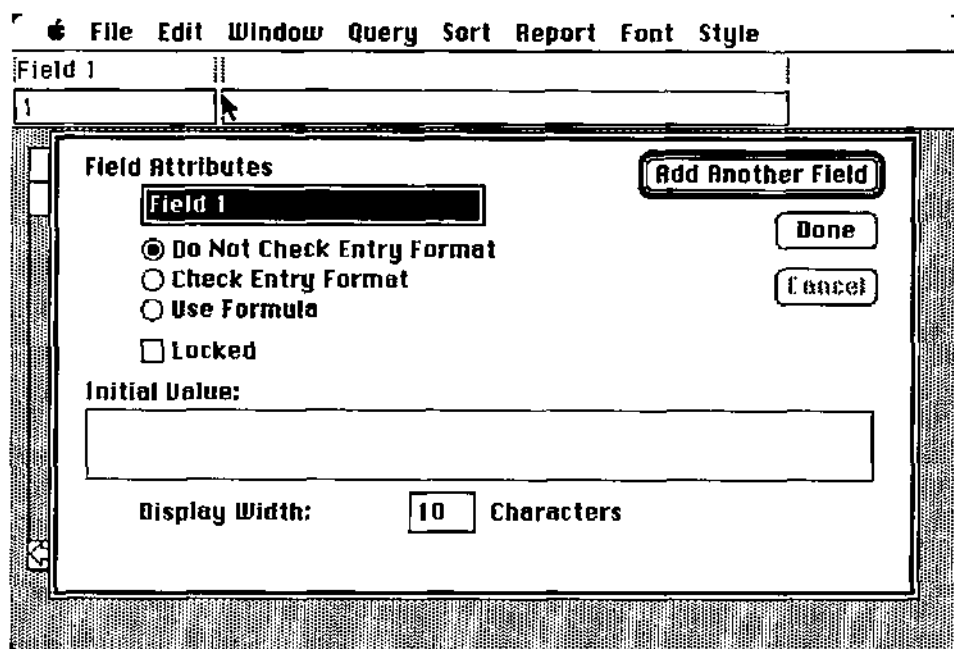


Figure 2.11: Completing the field definition.

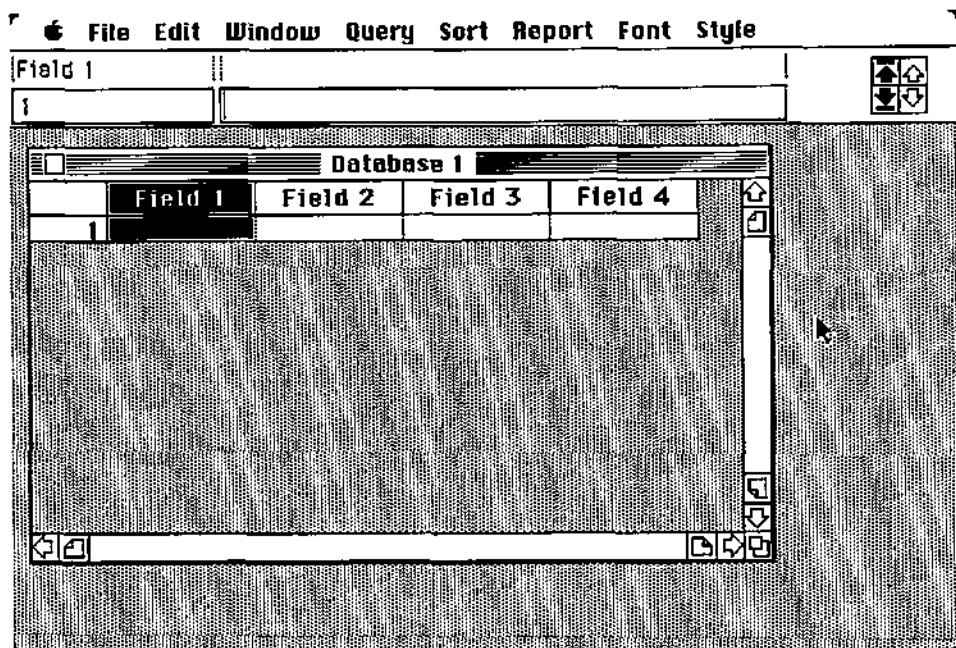
names classify data into the units of information you're interested in. The display width determines how long the units will be. Your format choices determine whether particular fields contain text or numbers and how the information looks.

Once the structure is defined, the database is ready for information. If you've been using the Field Attributes box, click **Done** or **OK** to display the Database window.

**The Database Window** Figure 2.12 is a typical Database window—the work area for reviewing and managing the contents of the database.

The Database window has the standard elements of any Macintosh window: a title bar, horizontal and vertical scroll arrows, a close box in the upper left corner, and a size box in the lower right. The page-turning box next to each scroll arrow is a quick way to page through the database one window at a time. Click the horizontal boxes to page left to right through the database fields. Use the vertical boxes to page up and down through the records.





**Figure 2.12: Database window.**

Figure 2.12 is the window for a new database that's just been set up using the Field Attributes box. The appearance of the default names Database 1, Field 1, Field 2, and Field 3 means that they weren't replaced with other names when the fields were defined.

Visually, a database always appears as a grid of columns and rows in the Database window. Each column is a field, with the field name at the top. Each row in the Database window is a record made up of individual field values. Rows and columns intersect in areas called cells. These are the locations that contain field values. Figure 2.13 has four fields and five records. Each field value, e.g., *Seattle*, *variable*, *New York*, and *cloudy*, appears in a cell.

Figures 2.12 and 2.13 are pictures of the same database at different stages of development. The new database in Figure 2.12 has a structure but no data. Figure 2.13 has information and informative field names. In this example, the progression from an empty database to something useful has several steps:

- Add empty records to the new database.
- Rename the fields.
- Type field values.

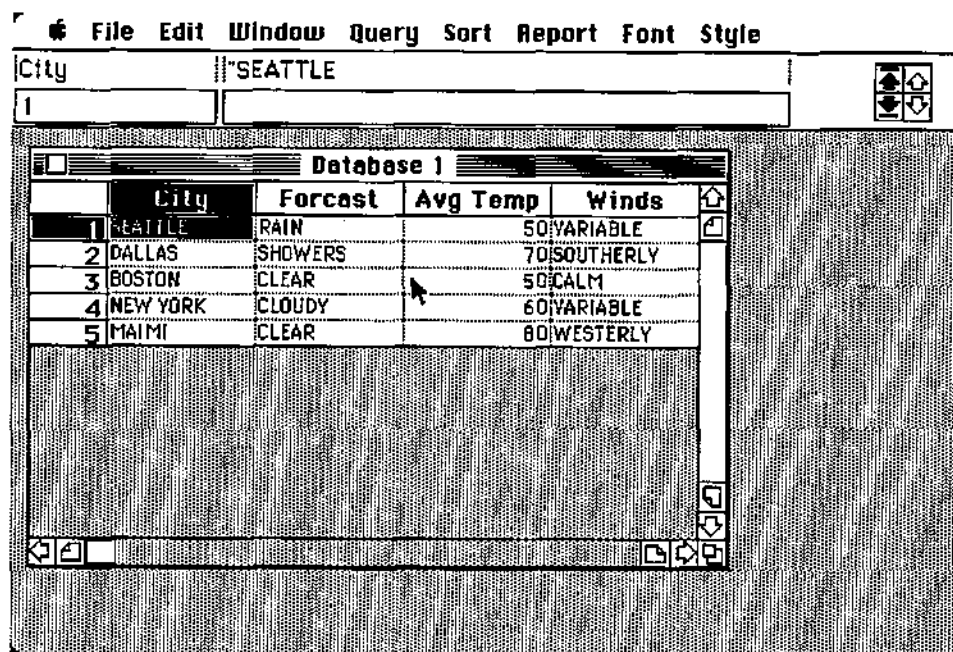


Figure 2.13: Fields and records.

**Adding Records to a Database** A new database always has one blank record, as in Figure 2.14. The first cell in the record is highlighted to show that it's the active cell.

The first step in using the database is to provide more blank records for the information that you'll enter. Jazz adds these records to the database sequentially below the existing records.

There are two techniques for adding blank records to the Database window. The first technique uses the Edit menu. When you need a blank record, select Add Record from the Edit menu as in Figure 2.15.

Figure 2.16 shows the new blank record below record 1. The records are numbered automatically as you add them.

A faster way to add blank records uses the key combination Command-N. To provide more blank records this way, hold down the Command key and type N for each blank record you want to add. Again, Jazz will add the blank records sequentially after the last record in the database.

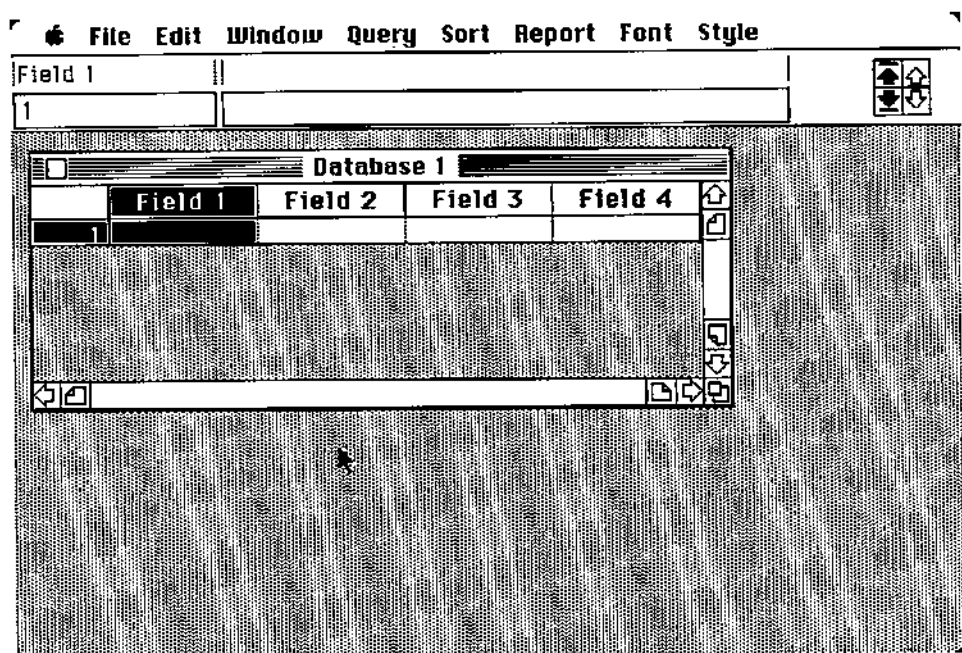


Figure 2.14: Blank record.

To remove a record—blank or otherwise—from the database, click the record number in the left column of the Database window. Then choose Clear Record from the Edit menu. Jazz deletes the record and renumbers those following it.

Blank records reserve space in the database for the information that you'll enter. You can start filling in information as soon as you've provided blank records for it. The field names, of course, identify the information to be entered for each record. Default field names aren't helpful in this regard. If, for some reason, you didn't define field names when setting up the database, it's still possible to define or change them from the Database window.

**Renaming Fields** When you set up a database, the information you're interested in largely determines what the field names will be. Since you define these names in the Field Attributes box, the Database window will include them rather than default field names.

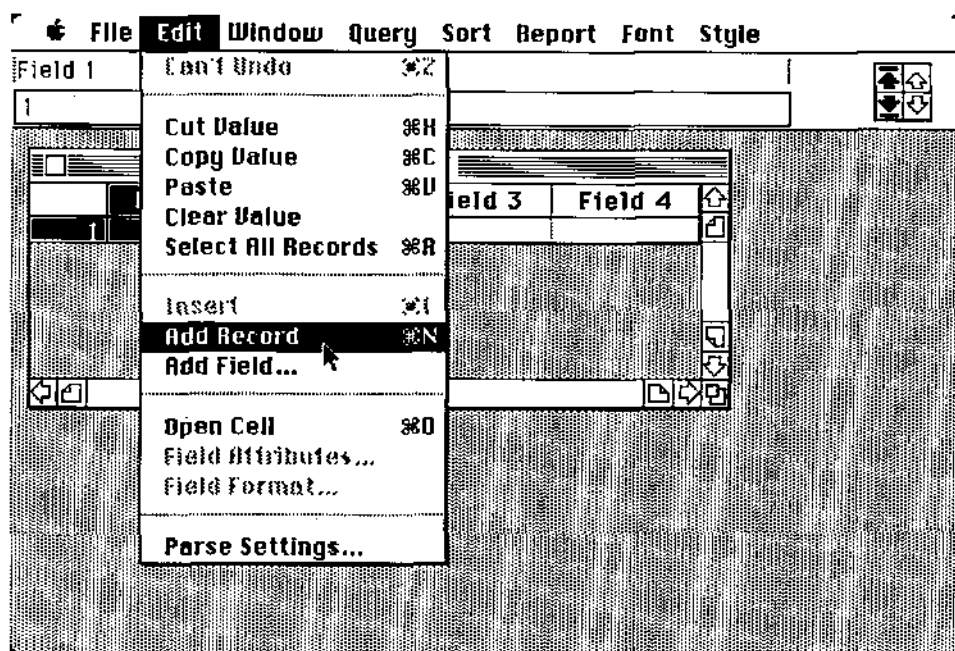


Figure 2.15: Adding a blank record.

If you decide to change a field name while using the Database window, click the name to select it as in Figure 2.17. This highlights the field name and the entire column beneath it. Then choose Field Attributes from the Edit menu.

Jazz responds with the same Field Attributes box that you used to set up the database. Define the field name and attributes as you would for a new database and click OK when you're done. The redefined field name replaces the name previously in the database. Repeat the sequence for any field name that you want to change.

Using the Field Attributes box, the field names in Figure 2.18 were redefined to those in Figure 2.19.

**Field Widths** If a column is too narrow for the field that you've defined, the field name will be truncated, as shown in Figure 2.20.

You have a choice of solutions. You can click the field name, choose Field Attributes from the Edit menu, and set a wider display

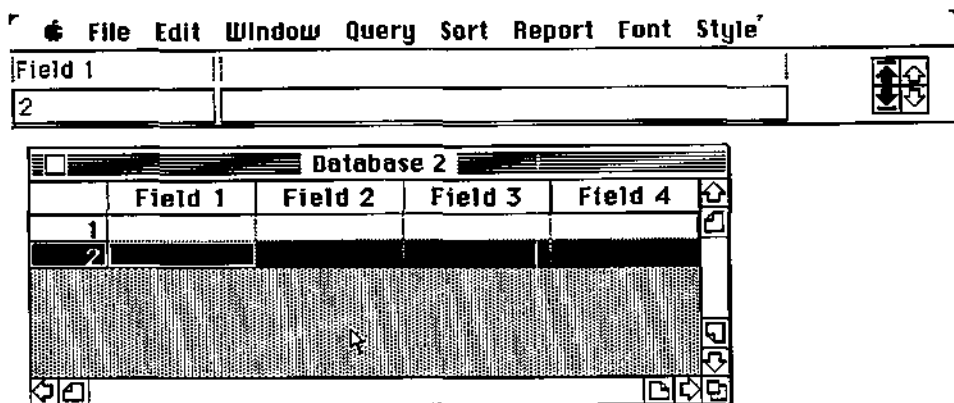


Figure 2.16: New blank records.

width, or you can widen the column by dragging the border of the field name cell to the right. Figure 2.21 shows how to position the cursor on the cell border.

**Data Entry and Editing** Defining field names and attributes are the preparatory part of database use. The working part starts with entering information into the database, then editing and managing it in a useful way. Jazz offers two approaches to data entry. You can open a database and type information directly in the Database window, or you can design data-entry forms that are linked to the database and specify exactly the information that you want to collect. Of course, one approach doesn't exclude the other—you can add information to the same database using both techniques.

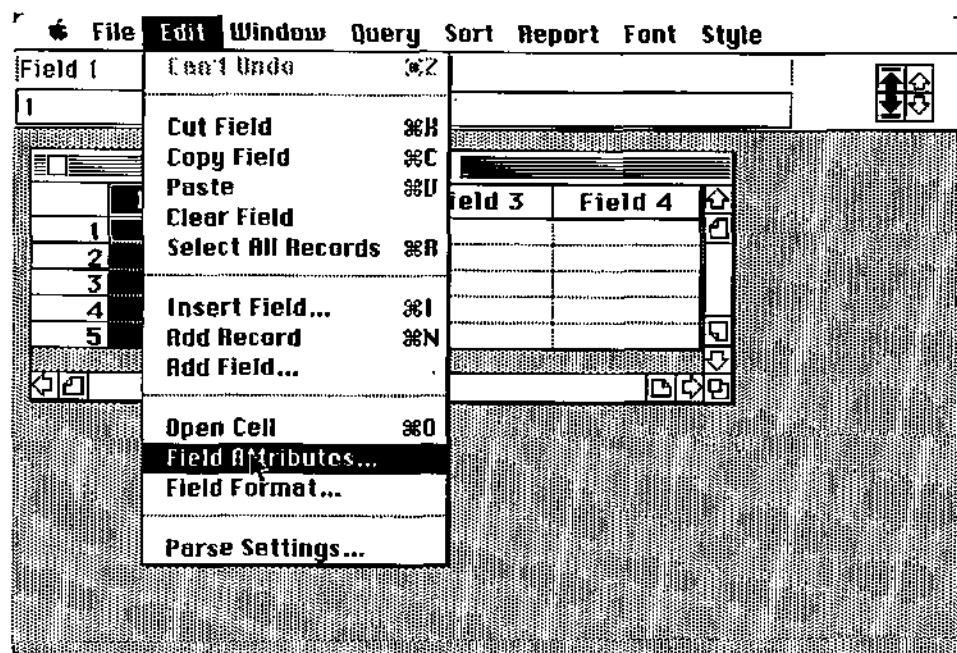
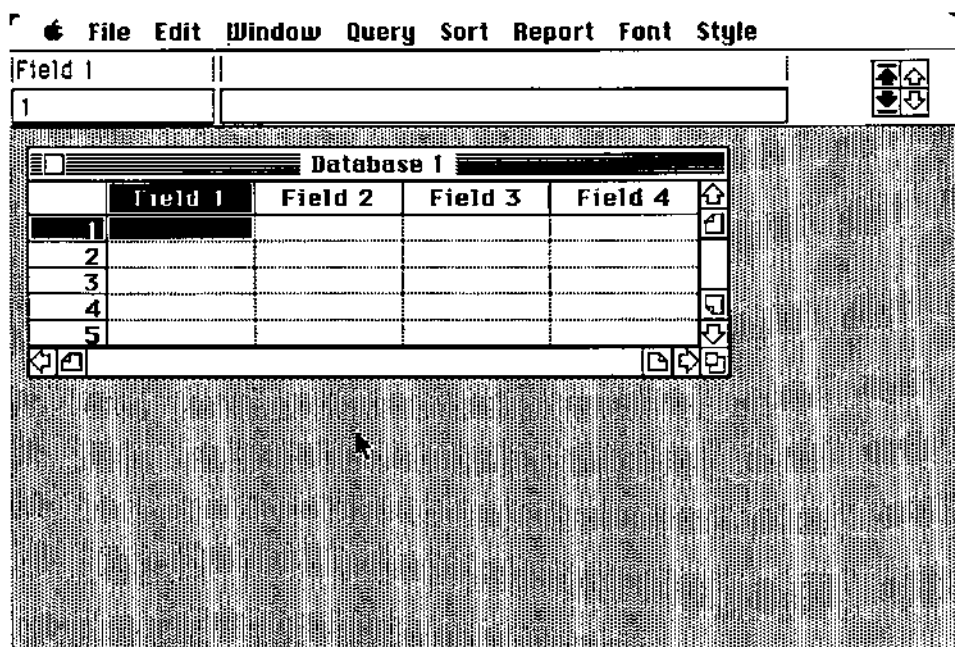


Figure 2.17: Field Attributes.

This section describes how to enter data in the Database window. The following section shows you how to design, modify, and use forms for data entry.

**Field Values** Once you've set up a database, you're ready to add information to it. The standard term for this is data entry, either in the Database window or with a form. Using the Database window, you can enter data by typing it directly or by pasting it in from another database or Jazz module. In any case, data entry means selecting a record in the database and filling in information.

The database consists of records; records consist of field values. Data entry is a matter of filling in field values. To enter a field value in the database, click the appropriate cell in the Database window, then type the entry. In Figure 2.22, the next value to be typed will appear in the Forecast field of record 2.



**Figure 2.18:** Default field names.

After typing a field value, move the cursor to the next cell in the record, click to make it active, and type a value. Repeat the sequence until you've entered the complete set of field values for the record. Then move down to the next record and complete it.

The Tab key speeds things up a bit. Rather than click the next cell after you've typed a field value, press Tab to move the cursor one cell to the right. Fill in the field value, then press Tab again to move to the right. This is a handy technique when you're filling in an entire record across the field columns.

The Return key is another alternative to the mouse for cursor movement. Pressing Return moves the cursor from its current cell to the cell directly below.

As you type a field value, it appears in the entry area above the Database window. Use standard Macintosh techniques to edit the value as needed before clicking to place it in the active cell. To erase the entry entirely, click the Cancel icon [X] next to the entry area.

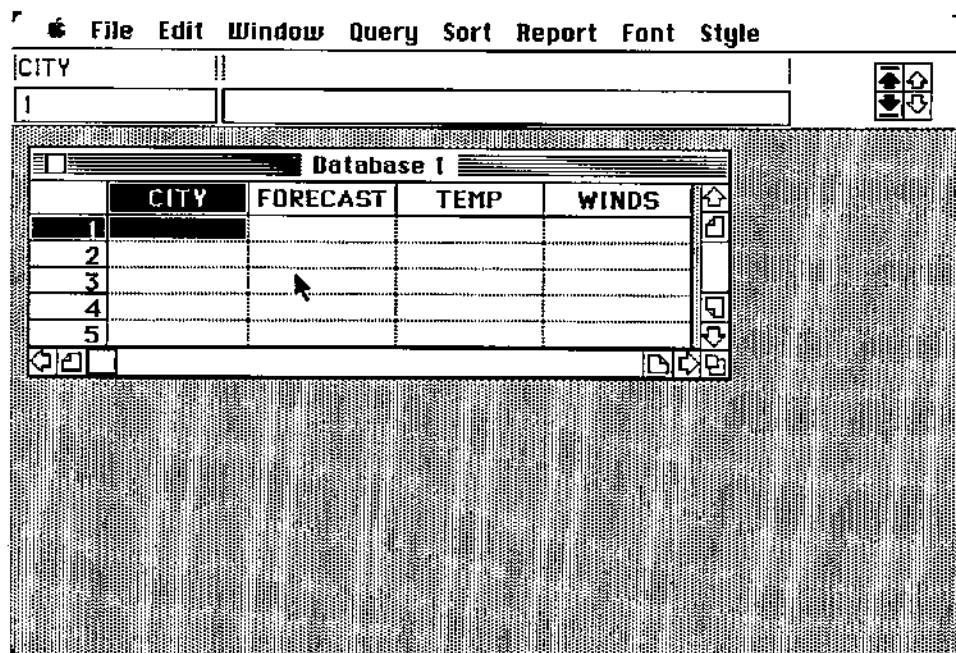


Figure 2.19: Descriptive field names.

**Data Formats** The database stores both text and numbers. Jazz treats field values that begin with a letter as text. As you type a text value, Jazz prefixes it with quotation marks to identify it as text. These appear only in the entry box, not in the cell in the Database window. If you want numbers to be treated as text so that they won't affect database calculations, precede them with quotation marks when you type them in the database.

Field values are also affected by any format restrictions that you've defined for a particular field. Use the Field Attributes box to specify whether field values should be checked for format when they are entered.

Figure 2.23 shows the Field Format command selected on the Edit menu. Choosing this command opens the Format display shown in Figure 2.24.

The formats from Fixed through General affect number values as shown below. In this example, we've specified three decimal places.



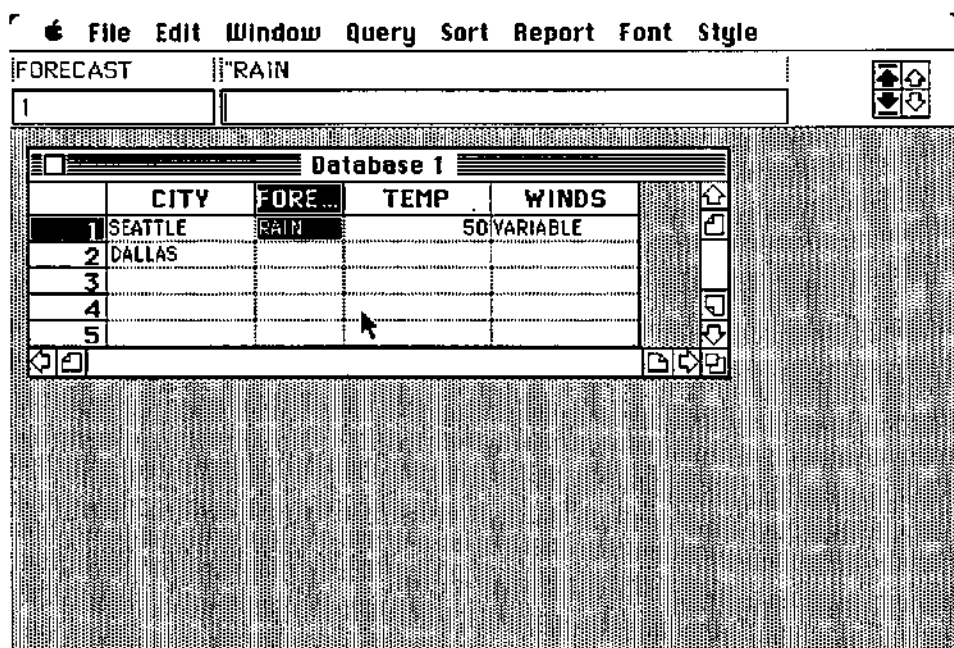


Figure 2.20: Truncated field name.

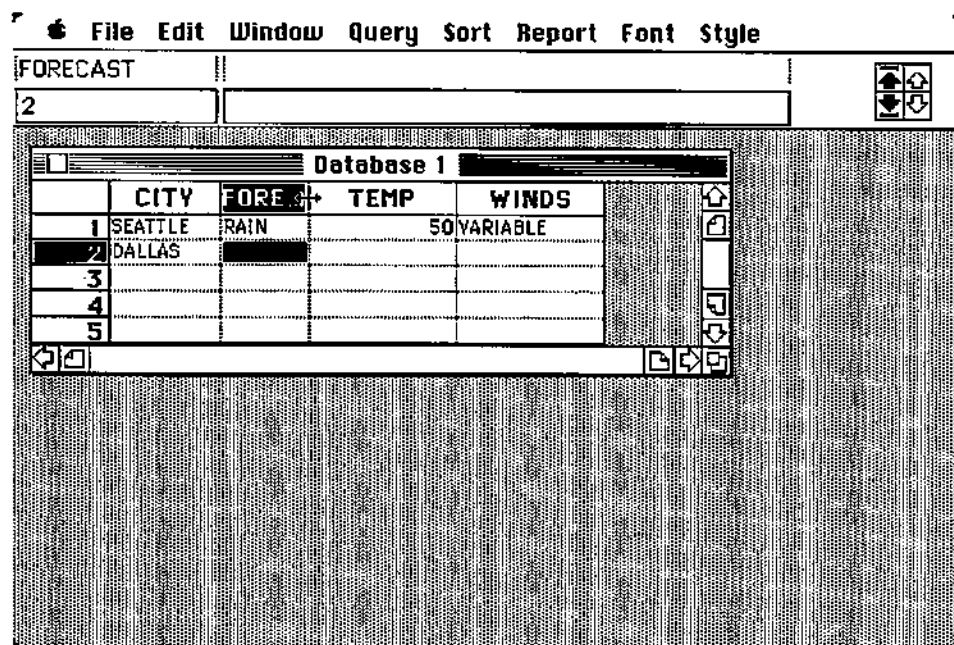


Figure 2.21: Dragging the cell border widens the column.

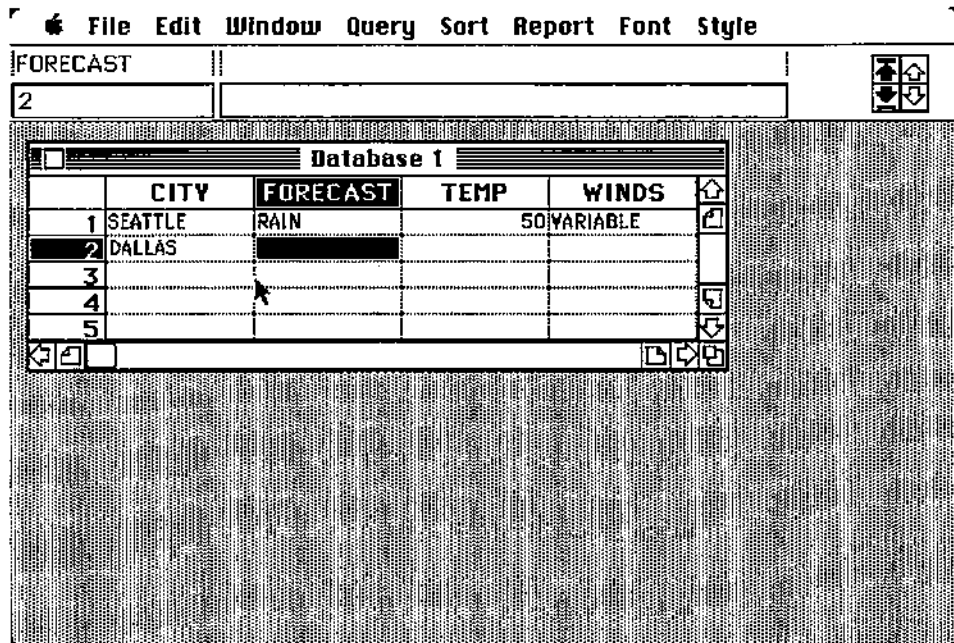


Figure 2.22: Selecting a cell.

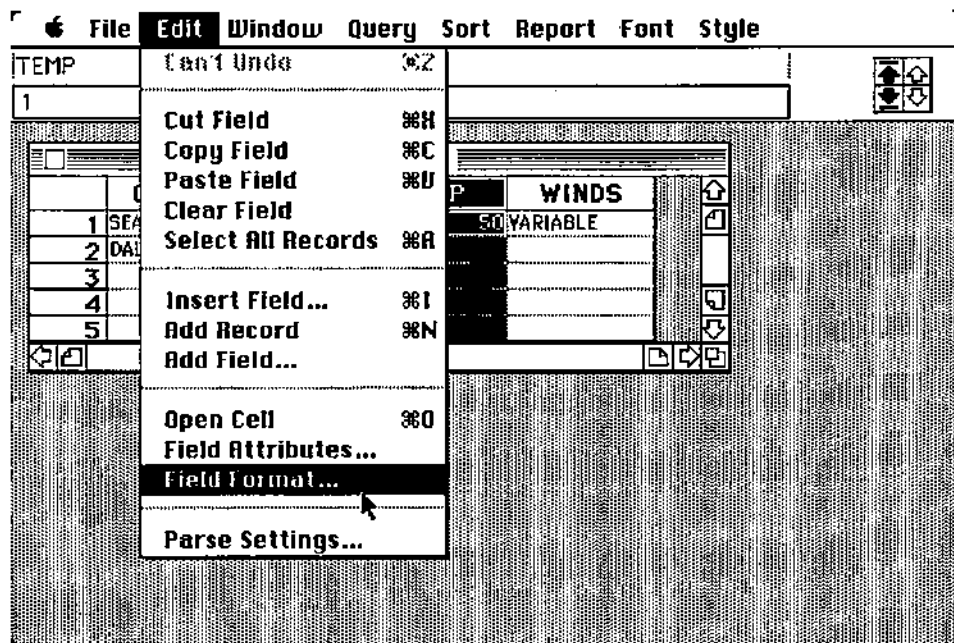


Figure 2.23: Field Format command.

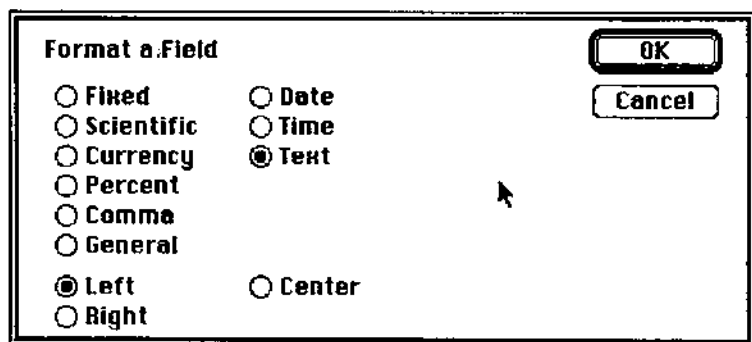


Figure 2.24: Format display.

#### Number Formats

|            |            |
|------------|------------|
| Fixed      | 198.000    |
| Scientific | 1.980E2    |
| Currency   | \$198.000  |
| Percent    | 19800.000% |
| Comma      | 198.000    |
| General    | 198        |

Clicking Date, Time, or Text in the Format display opens another set of choices for displaying field values, including four formats for date and four for time. Text can be left-aligned, right-aligned, or centered as it's entered in the cells of the database. Figure 2.25 shows the same value aligned differently in three fields.

The Field Attributes box and the Format display set formats for entire fields. Jazz also has a set of formatting characters for aligning individual text entries as you type them. Prefixing a field value with one of these characters as you type it results in text alignments like those shown in Figure 2.25.

#### Text Formatting Characters

|                           |                    |
|---------------------------|--------------------|
| Center a field value      | ^ (caret)          |
| Right-align a field value | ' (accent mark)    |
| Left-align a field value  | ' (apostrophe)     |
| Treat a number as text    | " (quotation mark) |

Once you've defined a field format, Jazz converts field values to that format as you enter them. If, for example, you've defined a field as Currency format, the numbers you type in that field will appear as

|   | Field 1  | Field 2  | Field 3  | Field 4 |
|---|----------|----------|----------|---------|
| 1 | HARRISON |          |          |         |
| 2 |          | HARRISON |          |         |
| 3 |          |          | HARRISON |         |
| 4 |          |          |          |         |
| 5 |          |          |          |         |
| 6 |          |          |          |         |

Figure 2.25: Text alignments.

dollars and cents. By choosing Check format from the Field Attributes box, you can also prevent the wrong type of data from being entered in the field. For example, a field that's been defined as Currency format and Check Format won't accept text values at all since they can't be converted to currency figures. Figure 2.26 shows the dialog box Jazz uses in this situation.

The mismatched field value remains highlighted in the entry box. Erase it by clicking the Cancel icon [X]. Or you can drag across the value and edit it in the entry box.

The format options in the database are also available in Jazz worksheets. This is extremely useful when you want to move data between these modules. The variety of formats also gives you the freedom to build databases for different kinds of data or accommodate several types of information in the same database.

**Selecting Fields and Records** Just as it's possible to modify field definitions and attributes from within the database, it's also possible to edit and change field values once they're entered. This requires you to select the values to be changed by making their cells active.

Cursor movement with the mouse is the basic technique for scrolling through the database and selecting areas in the Database

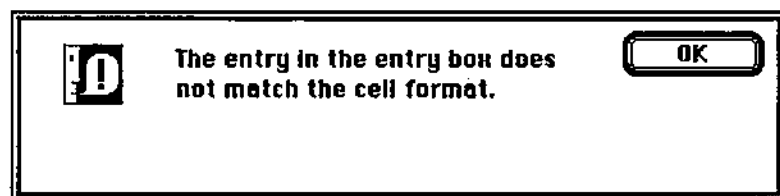


Figure 2.26: Format doesn't match.

window. The area selected can range in size from one cell to one record, groups of cells to groups of records, single fields to sets of fields, and, at the largest, all the records in the database. The selected area is always highlighted to indicate that it's active, and the next command you choose or action you take will affects that area. Some area of the Database window—a cell or field name, for example—is always highlighted. The selected area remains highlighted until you select another one.

To select a **single cell**, the smallest area in the database, click it. Three things happen: the cell becomes active, the record number for the cell is highlighted, and the cell contents, if any, appear in the contents box directly below the database menu bar.

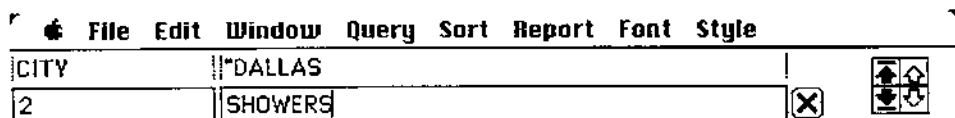
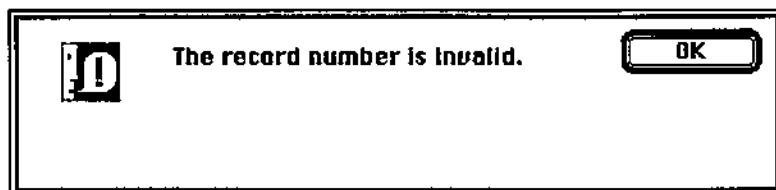


Figure 2.27 shows each of these effects. To make another cell active, click it.

The left column of the Database window shows record numbers. To select an entire record, click its number. A highlighting bar will appear across all the field values in the record, as in Figure 2.28. The first field value in the record appears in the contents box below the menu bar.

**Editing Database Entries** Clicking the record number is a fast way to select a record that appears in the Database window. You can also select any record in the database, even if it isn't in the window, by typing its number in the active record box. This box is just above the Database window, as shown in Figure 2.29.

To select a record using the active record box, click the box, type the record number, and press Return. Jazz scrolls through the database and brings the record you've selected to the top of the Database window. What happens if you type a record number that isn't in the database? Jazz responds with an Invalid Record box.



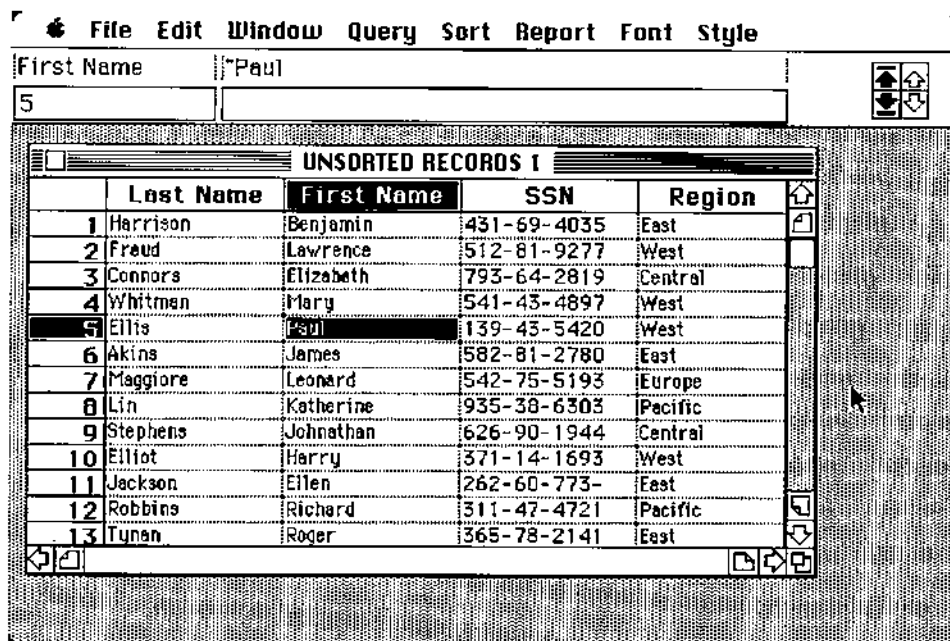


Figure 2.27: Active cell.

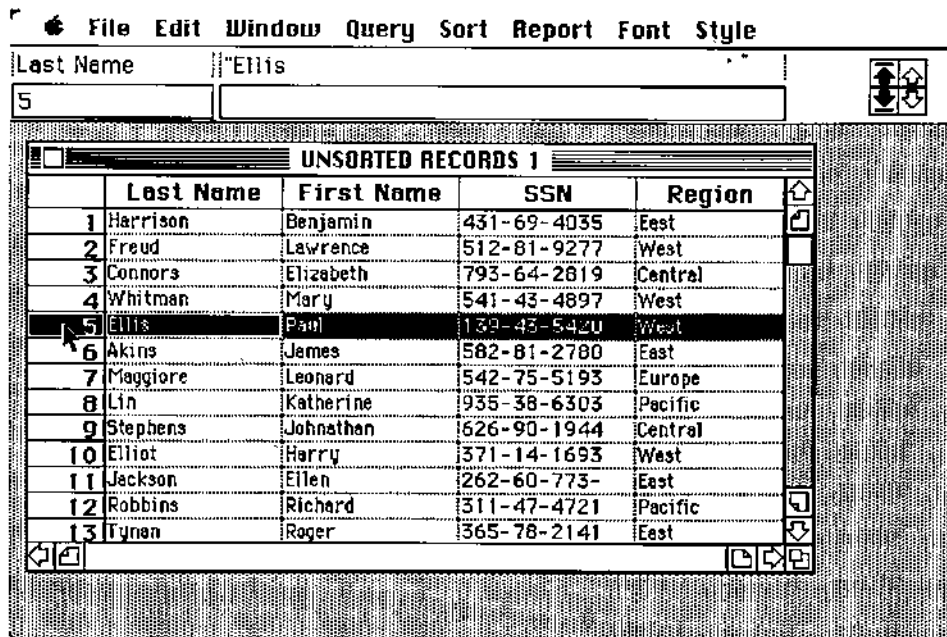


Figure 2.28: Selected record.

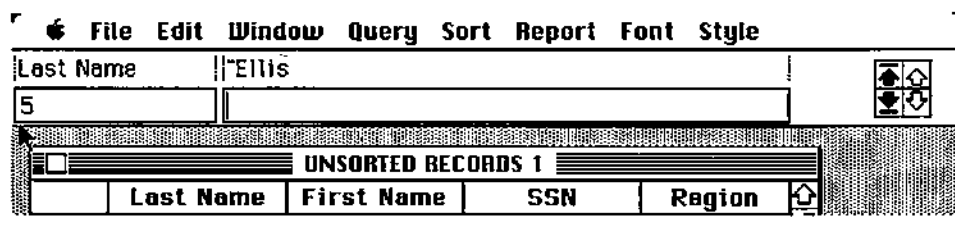


Figure 2.29: Active record box.

If this happens, click OK, then erase the invalid number from the active record box or use standard Macintosh techniques to edit the active record box as needed.

The Database window includes both scroll arrows and page-turning boxes for scanning through the database. Use any of these tools to scroll the database horizontally or vertically. Jazz also provides a record navigator for scanning the database and changing the active cell.

The black record navigator arrows switch between the first and last records in the database. Clicking the black up arrow from any point in the database activates the first cell of the first record. Clicking the black down arrow activates the first cell of the last record in the database.

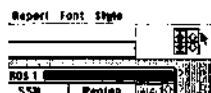
The white navigator arrows move the cursor vertically by one record. Clicking the white up arrow activates the cell above the currently active one. Clicking the white down arrow activates the cell directly below the currently active one.

**Selecting Groups of Cells and Records** Jazz has different techniques for selecting groups of cells and records, depending on whether they're separated or adjacent to each other. When you select a group of cells, the entire group is highlighted, and your next command or action affects the entire group.

**Selecting Adjacent Groups** The general rule for selecting adjacent records or fields is to drag the cursor from the first cell to the last cell that you want to include in the group. When you release the mouse button, all the cells that you've dragged across will be highlighted.

Here are the ways to select adjacent groups in the database:

- **Consecutive records**—drag up or down the column of record numbers.



- **Consecutive cells in the same field**—drag up or down the field column.
- **Adjacent cells in different fields**—drag diagonally across the field columns.
- **An entire column of field values**—click the field name.
- **All records in the database**—choose Select All Records from the Edit menu.

Figure 2.30 shows several of these selections.

It's possible to remove individual cells, records, or fields from a selected group by option-clicking—holding down the Option key while clicking with the mouse—the record number or field name. The rest of the selection will remain intact, but the specific record or field will no longer be highlighted. You can also cancel a selection entirely by clicking the Database window anywhere outside the highlighted area.

**Selecting Nonadjacent Groups** Dragging selects adjacent cells in the Database window. The technique for selecting nonadjacent areas is a bit different. The general rule here is to click the first cell,

| UNSORTED RECORDS 1 |           |            |             |         |
|--------------------|-----------|------------|-------------|---------|
|                    | Last Name | First Name | SSN         | Region  |
| 15                 | East      | Deborah    | 638-92-1038 | Europe  |
| 16                 | Glenn     | Edward     | 871-55-1872 | West    |
| 17                 | Cook      | Patrick    | 787-23-0845 | Central |
| 18                 | Clark     | Lee        | 457-49-0844 | Pacific |
| 19                 | Muller    | Elizabeth  | 943-19-5678 | Central |
| 20                 | Jefferson | Carla      | 603-90-4091 | East    |
| 21                 | Caffrey   | Paula      | 594-01-9252 | Central |

| UNSORTED RECORDS 1 |           |            |             |         |
|--------------------|-----------|------------|-------------|---------|
|                    | Last Name | First Name | SSN         | Region  |
| 4                  | Whitman   | Mary       | 541-43-4897 | West    |
| 5                  | Ellis     | Paul       | 139-43-5420 | West    |
| 6                  | Evins     | James      | 582-81-2780 | East    |
| 7                  | Flaggione | Leonard    | 542-75-5193 | Europe  |
| 8                  | Lin       | Katherine  | 935-38-6303 | Pacific |
| 9                  | Stephens  | Jonathan   | 626-90-1944 | Central |
| 10                 | Elliot    | Harry      | 371-14-1693 | West    |
| 11                 | Jackson   | Ellen      | 262-60-773- | East    |

Figure 2.30: Selecting adjacent cells.



record, or field you want to include, then option-click (hold down the Option key while you click with the mouse) additional record numbers or field names. Note that once you've clicked the first item, you make additional selections by clicking **record numbers** or **field names**, not cells.

In Figure 2.31, we've clicked Akins as the first cell in the group, then option-clicked records 10 and 13. This activates three cells: Akins, Elliot, and Tynan.

In Figure 2.32, we've selected additional cells by option-clicking the field name SSN—not by clicking the individual cells themselves. This makes a set of six nonadjacent active cells in three records.

The technique for selecting nonadjacent fields or records is similar to the one for selecting nonadjacent cells. Click the first field name or record number you want to include, then option-click additional field names or record numbers. Figure 2.33 shows a selection of nonadjacent records.

In all cases, to cancel a selection, click the Database window anywhere outside the highlighted area.

File Edit Window Query Sort Report Font Style

Last Name Harrison

1

|    | Last Name | First Name | SSN         | Region  |
|----|-----------|------------|-------------|---------|
| 5  | Ellis     | Paul       | 139-43-5420 | West    |
| 6  | Akins     | James      | 562-81-2780 | East    |
| 7  | Maggiore  | Leonard    | 542-75-5193 | Europe  |
| 8  | Lin       | Katherine  | 935-38-6303 | Pacific |
| 9  | Stephens  | Johnathan  | 626-90-1944 | Central |
| 10 | Elliot    | Harry      | 371-14-1693 | West    |
| 11 | Jackson   | Ellen      | 262-60-773- | East    |
| 12 | Robbins   | Richard    | 311-47-4721 | Pacific |
| 13 | Tynan     | Roger      | 365-78-2141 | East    |
| 14 | Thomson   | Anne       | 498-55-1780 | East    |
| 15 | East      | Deborah    | 638-92-1038 | Europe  |
| 16 | Glenn     | Edward     | 871-55-1872 | West    |
| 17 | Cook      | Patrick    | 787-23-0645 | Central |

Figure 2.31: Nonadjacent cells in the same field.

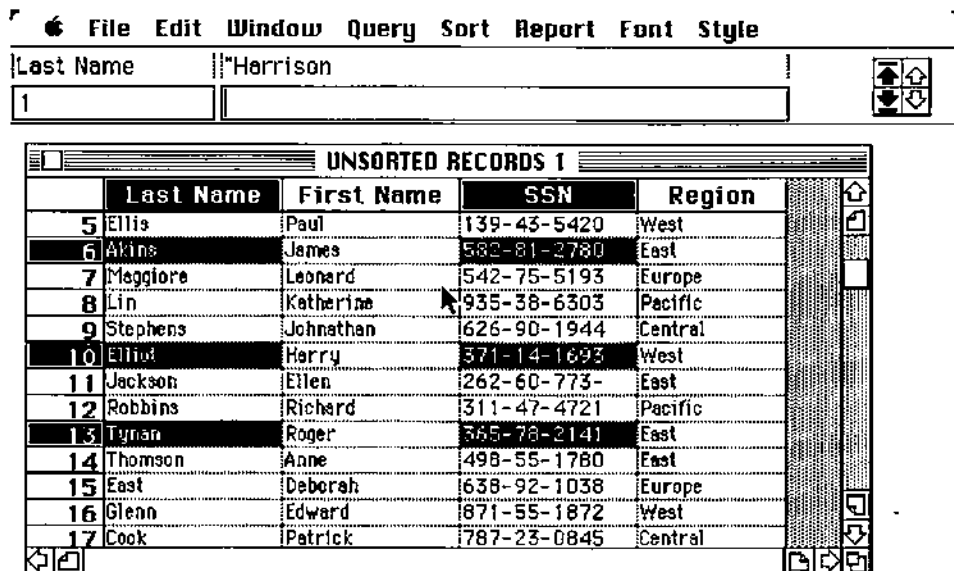


Figure 2.32: Nonadjacent cells in different fields.

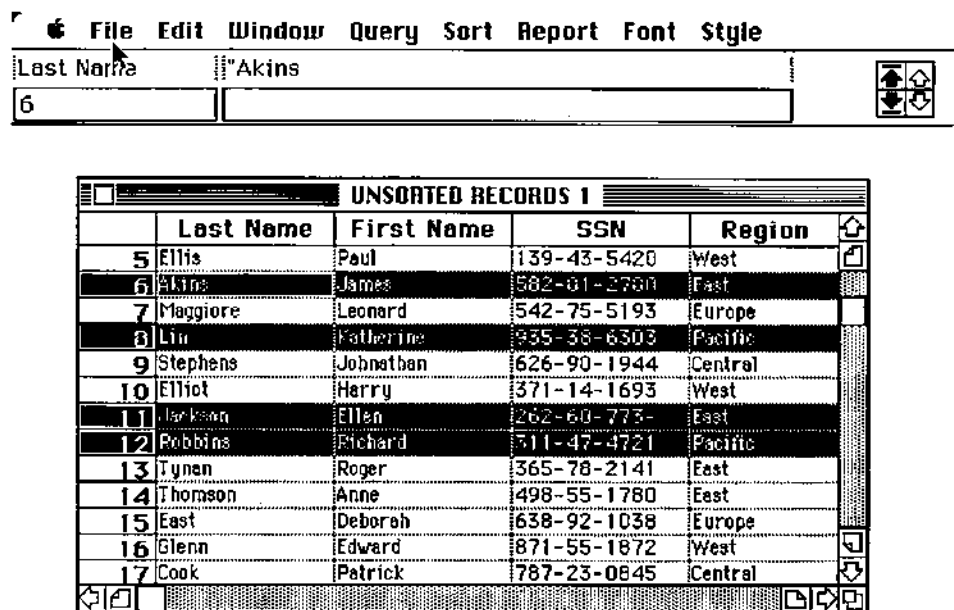


Figure 2.33: Nonadjacent records.

In summary, here are the ways to select nonadjacent groups in the database:

- **Nonadjacent cells**—click the first cell you want to include, then option-click the record number or field name of the additional cells.
- **Nonadjacent records or fields**—click the first record number or field name, then option-click additional record numbers or field names.

**Activating Individual Cells in a Selection** The usual way to make an individual cell active is to click it. However, when you click a cell in a group of selected cells, you cancel the selection. To make one cell active in a group of selected cells, use the Tab and Return keys. Use the Return key to cycle vertically through the selected cells in a field column. Use the Tab key to move horizontally between the selected fields. As you cycle through the selected cells, a white box outlines the active cell. Cell contents appear in the entry box above the Database window. Use standard Macintosh techniques to edit the contents of the entry box as needed.

Selecting a database area is part of the sequence that includes opening a database, defining fields, and entering data. Once you've selected a database area, you use another sequence to edit and modify the database, review data, move and copy information, or otherwise work with it. Many of these tasks use commands on the database Edit menu.

**Editing the Database** The basic technique for working with the database is to select an area in the Database window, then choose a command or carry out an action. Data entry is usually the first task after you set up the database and add blank records. Unless you're using a form, you'll type field values directly in the active cells of the Database window. The format and alignment settings you've specified when setting up the database affect the type of data that you enter and their appearance in the database.

You can change any of these settings or redefine field names by selecting the field name, then choosing Field Attributes or Field Format from the Edit menu. Use the Field Attributes box as you do when setting up a database.

For many editing commands, Jazz provides a safety feature called Undo. After you've chosen a command from the Edit menu, you

can usually reverse the command's effect and restore things to how they were by choosing Undo. This option is only available immediately after you carry out a given command. If you choose a command and then go on to something else, you won't be able to undo the command.

**Adding Records and Fields** Databases aren't static. They grow larger as you add new records and smaller as you remove those no longer needed. You provide room for new information by adding blank records and new fields to an existing database. New records can be added after the last record in the database or inserted between existing records. Once new records are added, you can enter field values in them as usual.

To add blank records at the end of the database, choose Add Record from the Edit menu. This is the same technique you use to add blank records when first setting up a database. Each time you choose the command, Jazz adds one blank record. You can also use Command-N to quickly add several blank records at the same time, just as in setting up a new database. Each time you type N while holding down the Command key, Jazz adds a blank record at the end of the database.

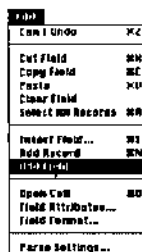
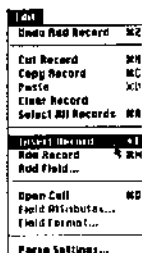
To insert a blank record between existing records, select the record that you want the blank one to be above. Then choose Insert Record from the Edit menu. Jazz inserts the blank record above the one that you selected and renumbers the records accordingly.

The technique for adding fields to a database is similar to the one for adding blank records. Blank fields can be added after existing ones or inserted between them. In each case, you must specify attributes for the new field before Jazz adds it to the database.

To add a new field, choose Add Field from the Edit menu, then define the field's name and attributes using the Field Attributes box. Click OK in the Field Attributes box to add the field to the database. Jazz automatically scrolls the database so that you can see the new field in the Database window.

To insert a new field between existing ones, select the field that you want to be to the left of the new one. Choose Insert Field from the Edit menu, and click OK after you've specified the field's attributes. The highlighted field in Figure 2.34 was inserted between the SSN and Region fields.

To undo any insert or add command, choose Undo from the Edit menu before going on to anything else.



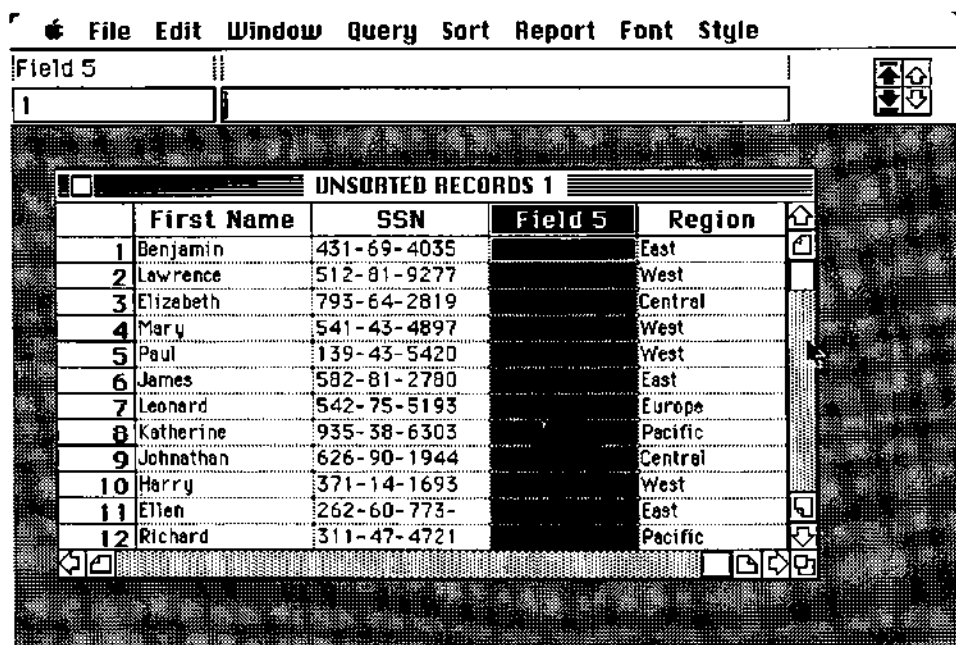


Figure 2.34: Inserted field.



**Clearing Database Areas** Clearing a database area erases its contents from the database. You can clear any area in the database—cells, records, fields, parts of records, or everything in the database—by selecting it and choosing Clear from the Edit menu.

Figure 2.35 shows a set of records selected in the database. Figure 2.36 shows the same database after the records have been cleared.

If necessary, the cleared records can be restored immediately afterward by choosing Undo Clear from the Edit menu.

The Clear command has slightly different effects for complete records and fields as opposed to individual cells or parts of records. If you select a record number or field name, Clear erases the entire record or field and renumbers the remaining records. Clearing individual cells in a record, however, leaves the rest of the record intact. Figure 2.37 shows a group of cleared cells in records 27 through 30. The remaining field values in those records weren't affected by the Clear command. The cleared cells themselves are ready for new data.

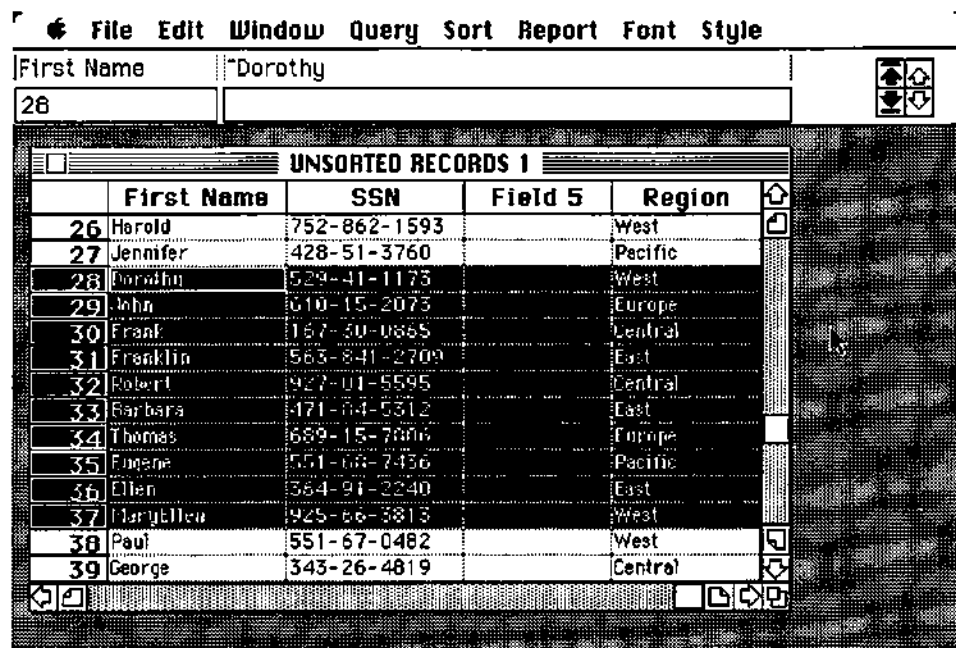


Figure 2.35: Records selected for clearing.

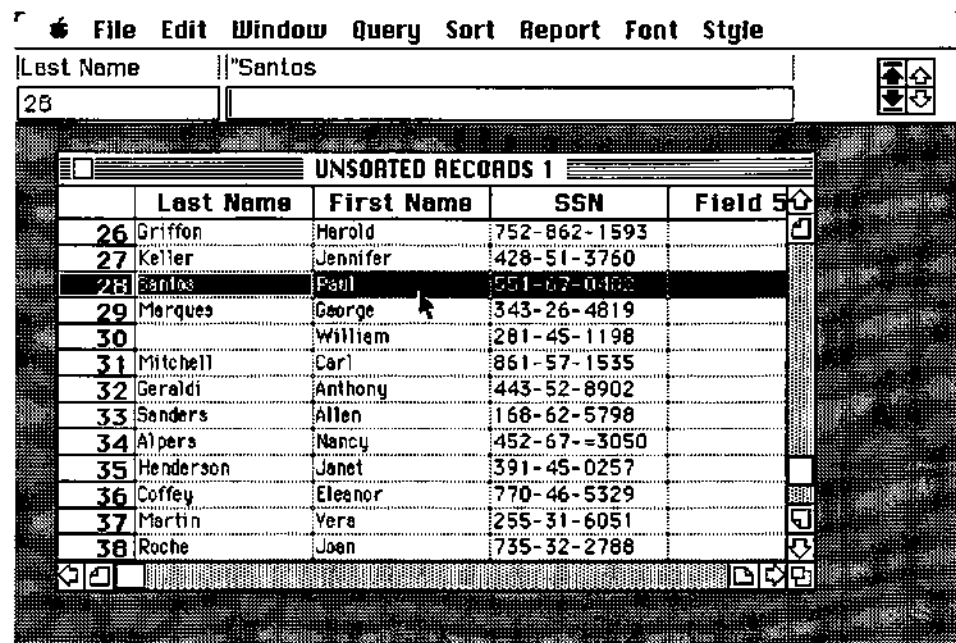


Figure 2.36: Cleared and renumbered database.

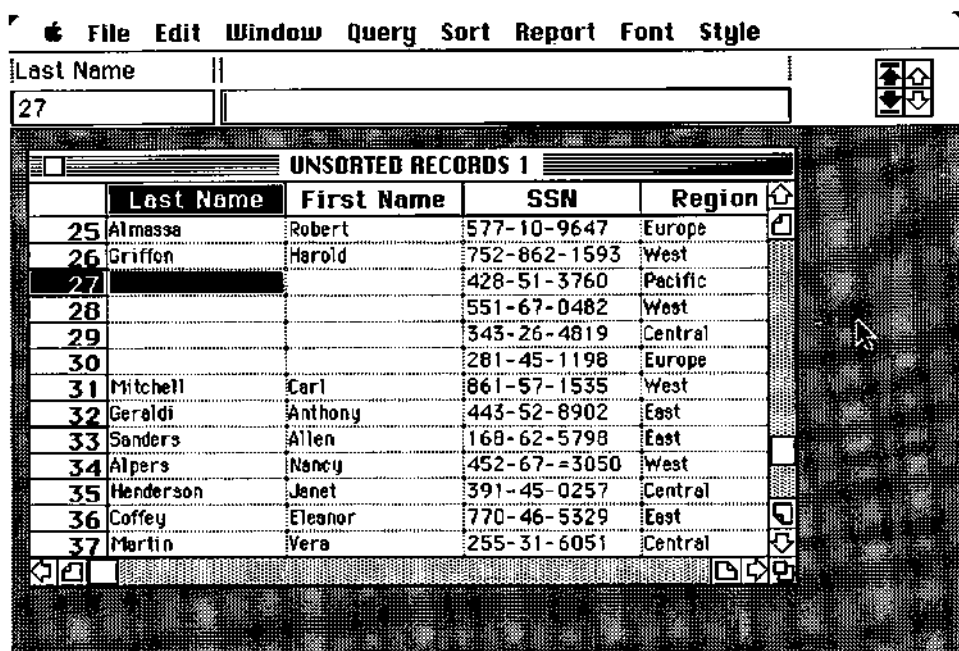


Figure 2.37: Cleared cells.



**Opening a Cell** The Clear command is useful for erasing cell contents but not for editing them. To edit a field value—the contents of the active cell—select the cell and choose Open Cell from the Edit menu. The cell contents will be highlighted in the entry area above the Database window, just as they are when you first type them in the database. Use standard Macintosh techniques to edit the contents as needed or erase them by clicking the Cancel icon [X]. When the field value is correct, click anywhere in the Database window to restore it to the active cell.

The Open Cell command also works for cells that belong to a group of records or fields you've selected. In this case, though, use the Tab and Return keys to outline the active cell, rather than clicking it.

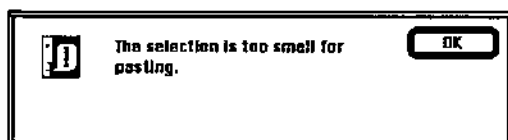
**Rearranging the Database** Jazz completes the editing choices with an ensemble of commands for rearranging the database. This means you can design the database for maximum

convenience and adapt it as your needs change. The Edit menu's Cut, Copy, and Paste commands make the Clipboard a tool for moving information in the database, between it and other Jazz modules, or between Jazz and other Macintosh programs.

Jazz's Cut and Paste commands follow standard Macintosh rules. Cut removes the selected material from the database. Copy duplicates the material onto the Clipboard but leaves the original in place. To cancel a cut or copy immediately after making it, choose Undo Cut or Undo Copy from the Edit menu.

Both Cut and Copy store the selected material temporarily on the Clipboard. To check the Clipboard contents, choose Clipboard from the Window menu. The Clipboard contains only the most recent item you've cut or copied. Each new cut or copy replaces anything already on the Clipboard.

As with all editing commands, the first step in rearranging the database is to select an area to work with. Depending on the area you've highlighted, the Edit menu will read Cut Value, Cut Record, Paste Value, Paste Record, and so on. The sequence below describes the technique for copying a field back into the same database. The area into which you're pasting has to be large enough for the material that you've selected. If not, Jazz responds with the dialog box below. In this case, drag again to select a larger area.



**Copying** The basic steps for copying material, or duplicating items, in a database is:

1. Select the material.
2. Choose Copy from the Edit menu.
3. Select the area for the copy.
4. Choose Paste from the Edit menu.

In Figure 2.38, four fields are visible in the Database window. Suppose the database contains eight or ten fields, not just the four in the window. When we scroll out to the fifth field or beyond, the last names won't be visible—we won't know whose records we're looking at. It would be convenient to copy the Last Name field to several



places in the database so the last names remain visible. This is a simple matter, but there's one thing to note: field names can't be repeated in the same database. Each field name is unique. Before pasting a copy of the field back into the database, we'll have to change the name of the original field.

We start by clicking the field name to select it, then choose Copy Field from the Edit menu, as in Figure 2.39.

Jazz takes less than a moment to copy the field onto the Clipboard. We check the Clipboard by choosing it from the Window menu. Figure 2.40 shows how it looks.

Before pasting in the copy, select the original field, choose Field Attributes from the Edit menu, and rename the field. We could, for example, change Last Name to Name. Having done that, we're ready to paste in the copy.

Jazz handles the copy as if it were a new field to be inserted between existing fields. It will paste the field to the left of the field that we select. In Figure 2.41, we've selected the Telephone field and chosen Paste Field from the Edit menu. Figure 2.42 shows the result. The copy can still be removed at this point with the Undo Paste command.

File Edit Window Query Sort Report Font Style

Last Name Robbins

12

UNSORTED RECORDS 1

|    | Last Name | First Name | SSN         | Region  |
|----|-----------|------------|-------------|---------|
| 12 | Robbins   | Richard    | 311-47-4721 | Pacific |
| 13 | Tynan     | Roger      | 365-78-2141 | East    |
| 14 | Thomson   | Anne       | 498-55-1780 | East    |
| 15 | East      | Deborah    | 638-92-1038 | Europe  |
| 16 | Glenn     | Edward     | 871-55-1872 | West    |
| 17 | Cook      | Patrick    | 787-23-0845 | Central |
| 18 | Minh      | Lee        | 457-49-0844 | Pacific |
| 19 | Muller    | Elizabeth  | 943-19-5678 | Central |
| 20 | Jefferson | Carla      | 663-92-4091 | East    |
| 21 | Caffrey   | Paula      | 594-01-9252 | Central |
| 22 | Allen     | Thomas     | 293-31-0209 | West    |
| 23 | Adams     | Samuel     | 689-75-1730 | Pacific |
| 24 | Franklin  | Julius     | 220-75-8345 | Central |

Figure 2.38: Four fields.

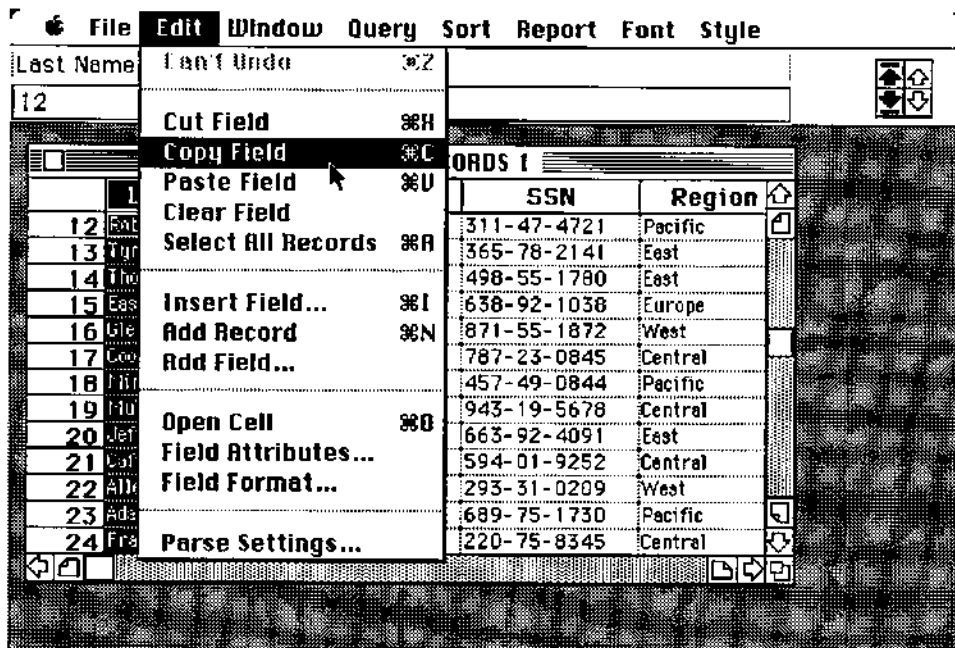


Figure 2.39: Copy field.

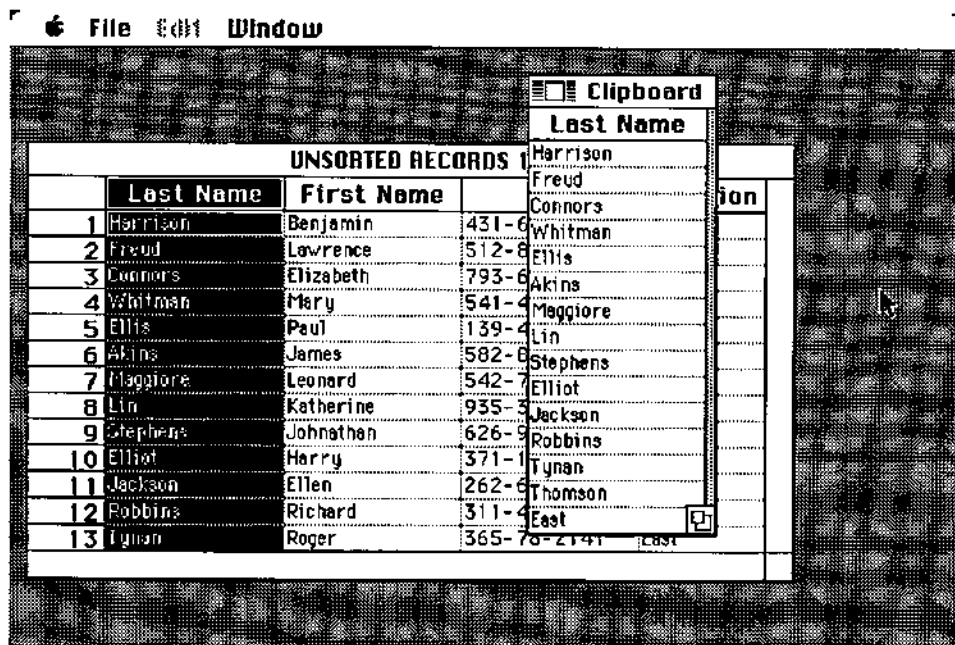


Figure 2.40: Clipboard copy.

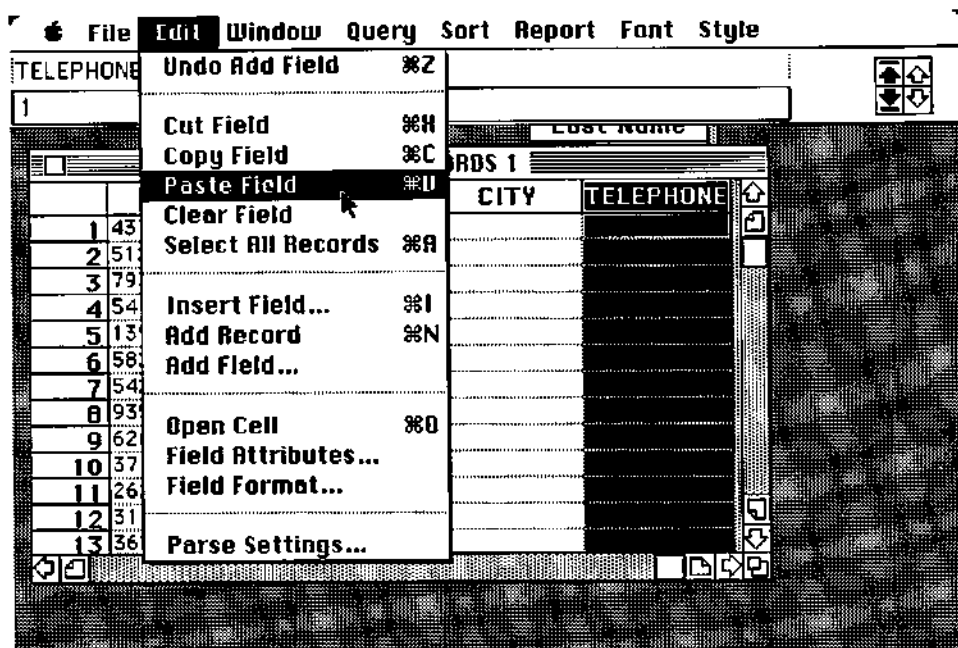


Figure 2.41: Choose Paste from the Edit Menu.

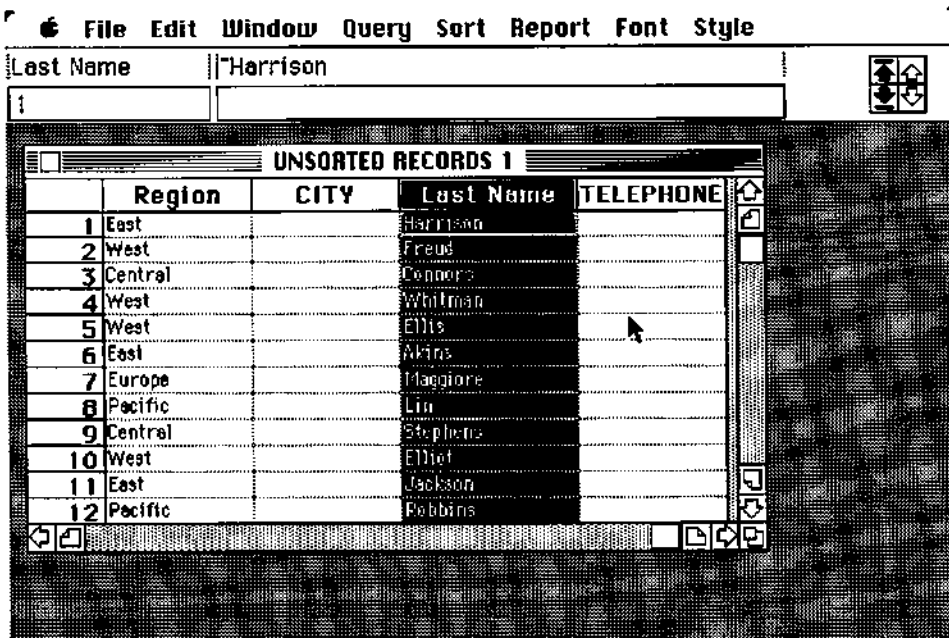


Figure 2.42: Copied field.

Copying an entire field several times in the same database could be awkward, since the original field name has to be changed before pasting in each copy. Copying cells, records, or groups of material is more straightforward and uses the same copy and paste sequence.

As with inserting new fields and records, Jazz pastes fields to the left of the selected field and pastes records above the selected record.

One thing to note about pasting into occupied cells is that the pasted values replace the existing field values.

**Moving Database Items** The basic steps for moving items in a database are:

1. Select the items.
2. Choose Cut from the Edit menu.
3. Select the new area for the items.
4. Choose Paste from the Edit menu.

Once you've cut something, it no longer exists in its original location.

If you cut part of a record or group of records, the cut area remains blank and available for new field values. When you cut a field, record, or group of records, however, Jazz fills the empty area and renumbers the remaining records. As with inserting new fields and records, Jazz pastes fields to the left of the selected field and pastes records above the selected record.

Pasting into occupied cells replaces the existing contents of the cells.

Pasting into an occupied cell replaces the existing cell contents. Before pasting into an occupied cell, be sure you no longer need the data that are already there.

**Copying between Documents** The Cut and Paste commands can be used to move data within a database, between databases, or between databases and other documents. Figure 2.43 shows windows for two databases, Personnel and Phone List. It's easy enough to copy the Telephone field from the Phone List to the Personnel database.

In Figure 2.44, we've selected the Telephone field by clicking the field name, then we chose Copy Field from the Edit menu. Figure 2.45 shows the copied material on the Clipboard.

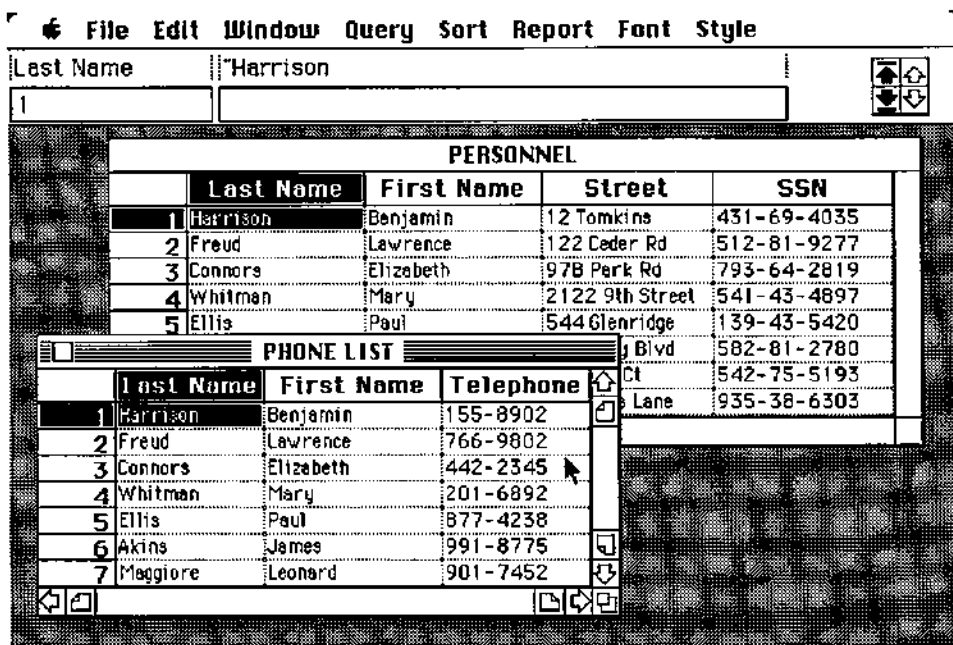


Figure 2.43: Two databases.

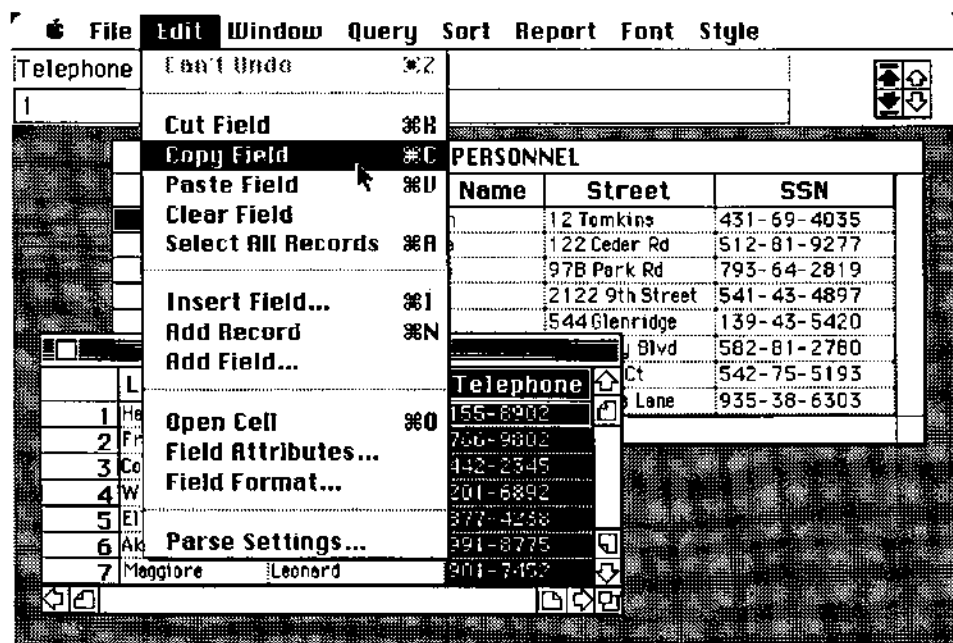


Figure 2.44: Copying the selected area.

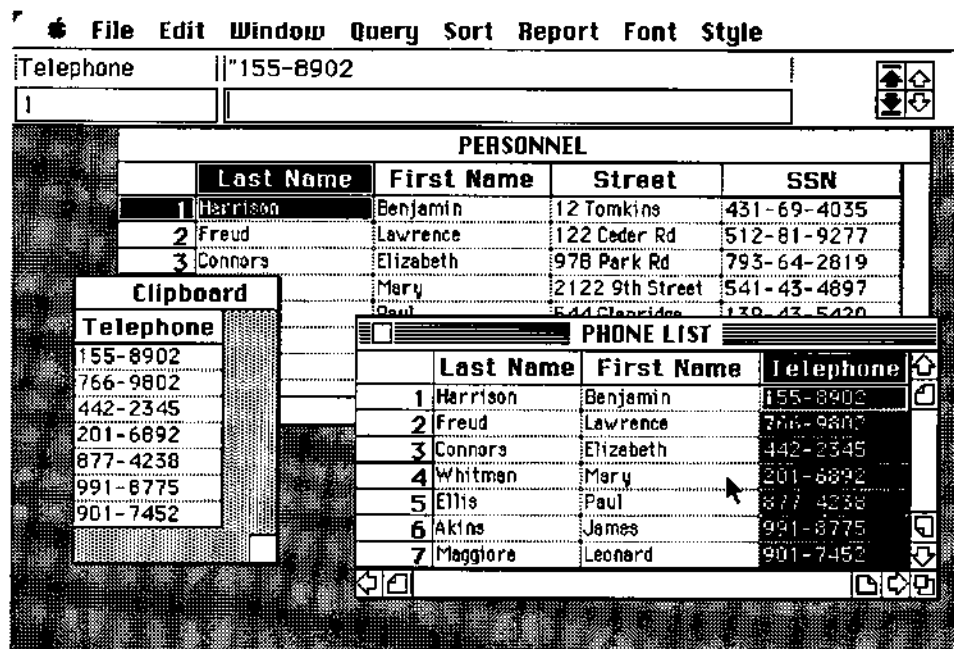


Figure 2.45: Check the Clipboard.

We want the telephone numbers from the Phone List database to appear after the first names in the Personnel database. Since Jazz inserts new fields to the left of the selected field, we select the Street field before pasting, as in Figure 2.46, then choose Paste Field from the Edit menu. Figure 2.47 shows the result—the new field is inserted between the First Name and Street fields in the Personnel database.

Being able to combine information from different databases means you can use information from existing databases to create new ones. Since you can copy the data rather than type the same information over again into the new database, you save time and minimize data entry errors.

There are several points worth noting when copying data between databases. Fields can only be moved one at a time. If you're copying or transferring several fields between databases, you'll have to repeat the cut and paste or copy and paste sequence for each one. You should also be careful when selecting areas to cut or copy, particularly when working with fields, as discussed below.

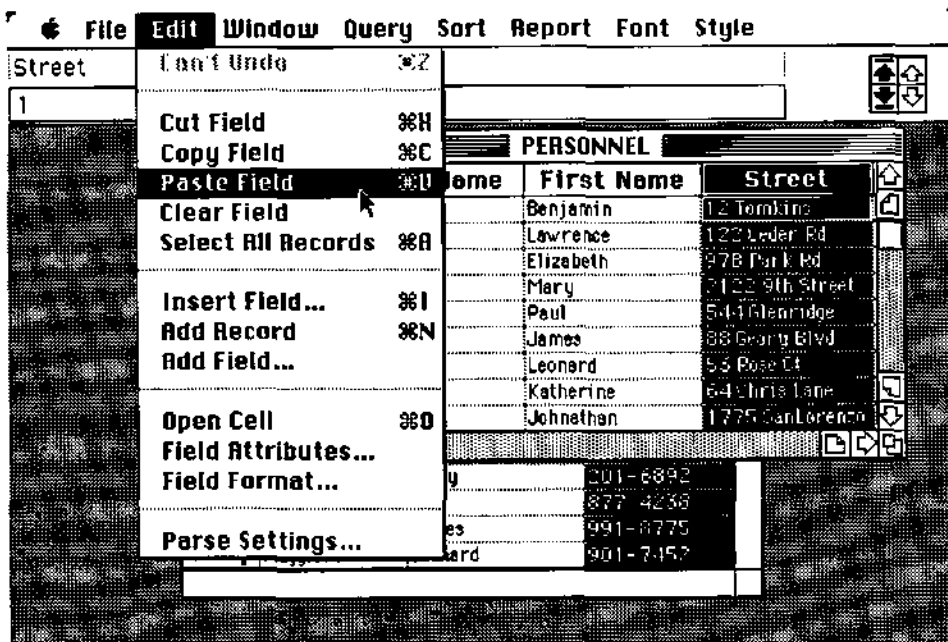


Figure 2.46: Fields are pasted to the left of the selected area.

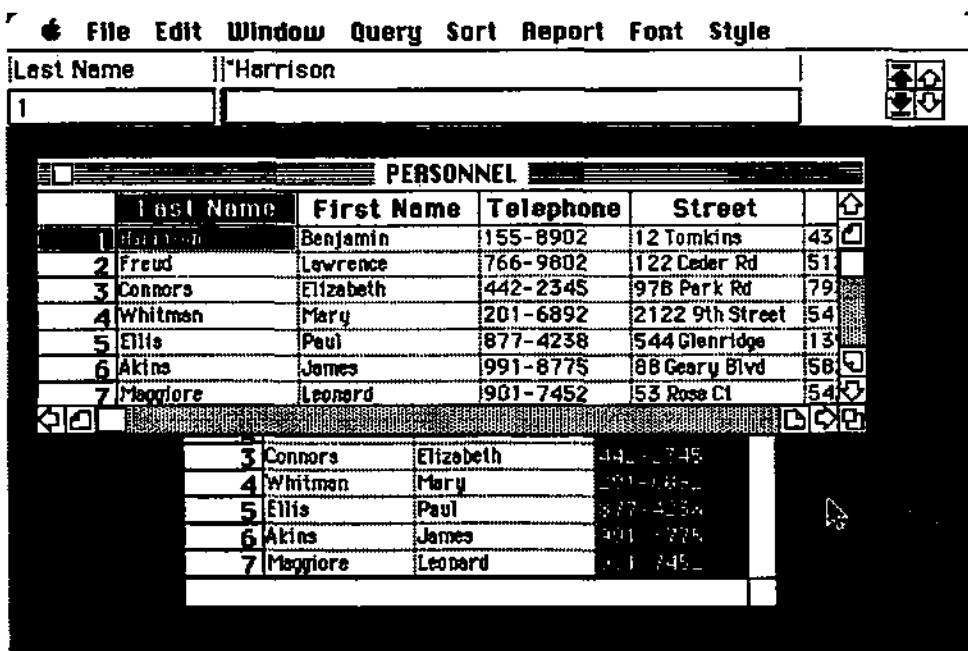


Figure 2.47: Phone Number field added to the Personnel database.

**Copying Fields** Figure 2.48 shows a selection of field values. The highlighted area in Figure 2.48 may represent the entire First Name field. If this is the case, the field was selected by clicking the field name. It is also possible that this selected area only includes the group of field values that have been dragged across. The only visual clue that the selections are different is the record number. For a field selection, the record numbers aren't highlighted. For a selection of individual records, the numbers are highlighted. It's easy to overlook the difference, especially when several windows are open on the desktop or when you've pulled down a menu. Although the selected areas look similar in both cases, there's a very different effect when you paste the selected values somewhere else.

If the selected area in Figure 2.48 is a field, you can paste it between existing fields. But suppose the area is really a group of cells, even though it looks like a selected field. When you paste them between fields—thinking that you're working with a field—the cell contents replace the existing values. Instead of a new field, you get new values in the existing fields. The Undo command was designed for situations like this. It restores the database to its state before the paste so that you can check or modify the selection.

The Edit menu itself makes plain whether you've selected a value, record, or field. As shown in Figures 2.49 and 2.50, the selected areas look the same, but the menu is worded differently for fields and values. Before going ahead with a cut and paste or copy and paste, it's worth checking the menu to confirm that you've selected the right area.

|   | Last Name | First Name | Telephone | Street          |    |
|---|-----------|------------|-----------|-----------------|----|
| 2 | Freud     | Lawrence   | 766-9802  | 122 Cedar Rd    | 51 |
| 3 | Connors   | Elizabeth  | 442-2345  | 97B Park Rd     | 79 |
| 4 | Whitman   | Mary       | 201-6692  | 2122 9th Street | 54 |
| 5 | Ellis     | Paul       | 877-4238  | 544 Glenridge   | 13 |
| 6 | Akins     | James      | 991-8775  | 88 Geary Blvd   | 58 |
| 7 | Maggiore  | Leonard    | 901-7452  | 53 Rose Ct      | 54 |

Figure 2.48: Selected field values.



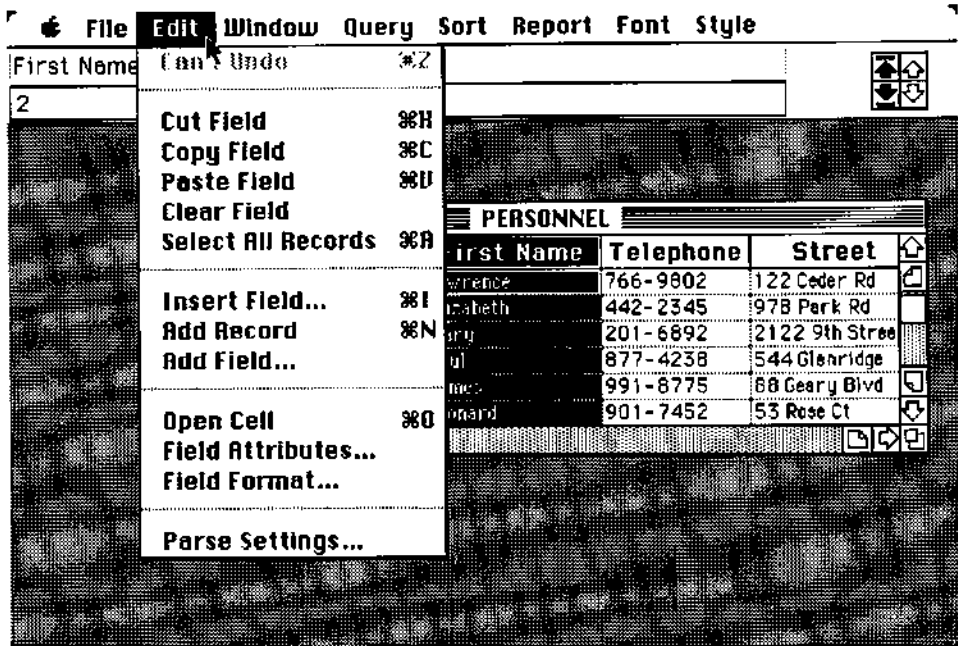


Figure 2.49: Edit menu for a field selection.

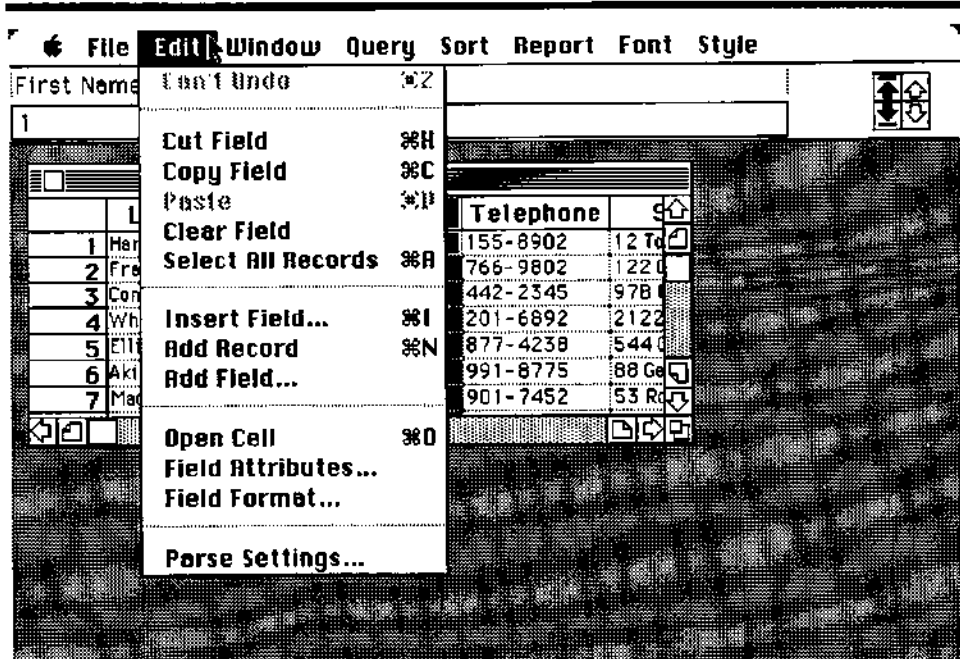


Figure 2.50: Edit menu for a group of selected values.

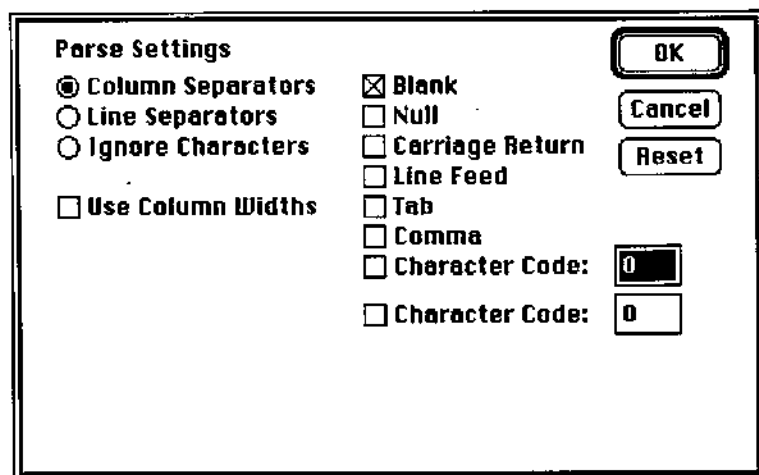
**Parse Settings** Parse settings affect material pasted into the database from three sources: the Jazz word processor module, the communications module, and other Macintosh programs. Both the database and the worksheet organize data in a grid of columns and rows. But a word processed document uses lines and spaces to separate information into words and sentences. Other programs may organize information differently. Parse settings determine how Jazz fits this information into the database format of record rows and field columns.

Unless you change the setting, Jazz uses tabs to separate columns and carriage returns to separate lines. Other programs use commas rather than tabs or a combination of spaces and special characters to divide information. These separators define where each item of information—a word or number—begins and ends. The Parse Settings dialog box lets you redefine the column and line separators. You need to use it only when pasting information from the word processor, directly through a communications line, or from another Macintosh program. It isn't necessary to make parse settings when moving information between databases or between the database and worksheet modules.

Before defining parse settings, check the format of the document you're pasting to see how it's organized. Then return to the Database window and choose Parse Settings from the Edit menu. Figure 2.51 shows the Parse Settings box.

The options for each setting are listed on the right side of the dialog box. Select column and line separators as appropriate for the information you're bringing into the database. The dialog box includes commonly used codes, which you can supplement by typing ASCII codes in the character code box. (ASCII codes are a standard set of characters used by almost all microcomputer software.) Data from other programs may include special characters not used by Jazz. Choosing Ignore Characters causes them to be disregarded when the data is pasted into the database.

The Column Separators option is one way to specify where Jazz should start each new column of data. Use Column Widths is an alternate way to define the number of characters per field. The default value, 7, means Jazz will place seven characters in each field before moving on to the next field. The dialog box provides settings for up to eight fields. After filling the eighth field, Jazz moves down to the new record and begins filling it.



**Figure 2.51:** Parse settings format some types of data.

When you've finished the parse settings, click OK to put them into effect, or click Reset to restore default settings. Then paste the information into the database.

**Style and Printing** The Style menu offers six type styles. The entire database will appear in the style you choose from this menu, with the font and type size chosen from the Font menu. Figures 2.52 and 2.53 show two possibilities. In Figure 2.52 we've removed the grid lines that define rows and columns. In Figure 2.53 we've changed the point size and removed both grid lines and record numbers.

Using boldface or a larger type size makes the Database window easier to read. It's also convenient to be able to adjust size and style before printing a database selection. Figure 2.54 illustrates the effect. We've increased the type size to 14-point and selected an area for printing. Choosing Print Selection from the File menu and selecting Standard Print Quality from the Print dialog box will give the print-out in Figure 2.55.

Notice that the names and telephone numbers in Figure 2.55 aren't centered under the field names. The field values are left-aligned in the database and appear that way on the printed copy. It's easy enough to center the field values. Select a field, then choose

File Edit Window Query Sort Report Font Style

|            |          |  |
|------------|----------|--|
| First Name | Lawrence |  |
| 2          |          |  |

| PERSONNEL |            |           |                 |  |
|-----------|------------|-----------|-----------------|--|
|           | First Name | Telephone | Street          |  |
| 1         | Benjamin   | 155-8902  | 12 Tomkins      |  |
| 2         | Lawrence   | 766-9802  | 122 Cedar Rd    |  |
| 3         | Elizabeth  | 442-2345  | 97B Park Rd     |  |
| 4         | Mary       | 201-6892  | 2122 9th Street |  |
| 5         | Paul       | 877-4238  | 544 Glenridge   |  |
| 6         | James      | 991-8775  | 88 Georg Blvd   |  |
| 7         | Leonard    | 901-7452  | 53 Rosa Ct      |  |
| 8         | Katherine  | 902-1414  | 64 Chad Lane    |  |
| 9         | Johnathan  | 652-1623  | 1775 SanLorenzo |  |
| 10        | Harry      | 287-9024  | 322 Menlo Drive |  |

Figure 2.52: Boldface text, grid lines hidden.

File Edit Window Query Sort Report Font Style

|           |          |  |
|-----------|----------|--|
| Last Name | Maggiore |  |
| 7         |          |  |

| PERSONNEL |            |           |  |  |
|-----------|------------|-----------|--|--|
| Last Name | First Name | Telephone |  |  |
| Harrison  | Benjamin   | 155-8902  |  |  |
| Freud     | Lawrence   | 766-9802  |  |  |
| Connors   | Elizabeth  | 442-2345  |  |  |
| Whitman   | Mary       | 201-6892  |  |  |
| Ellis     | Paul       | 877-4238  |  |  |
| Akins     | James      | 991-8775  |  |  |
| Maggiore  | Leonard    | 901-7452  |  |  |
| Lin       | Katherine  | 902-1414  |  |  |

Figure 2.53: Grid lines and record numbers hidden.

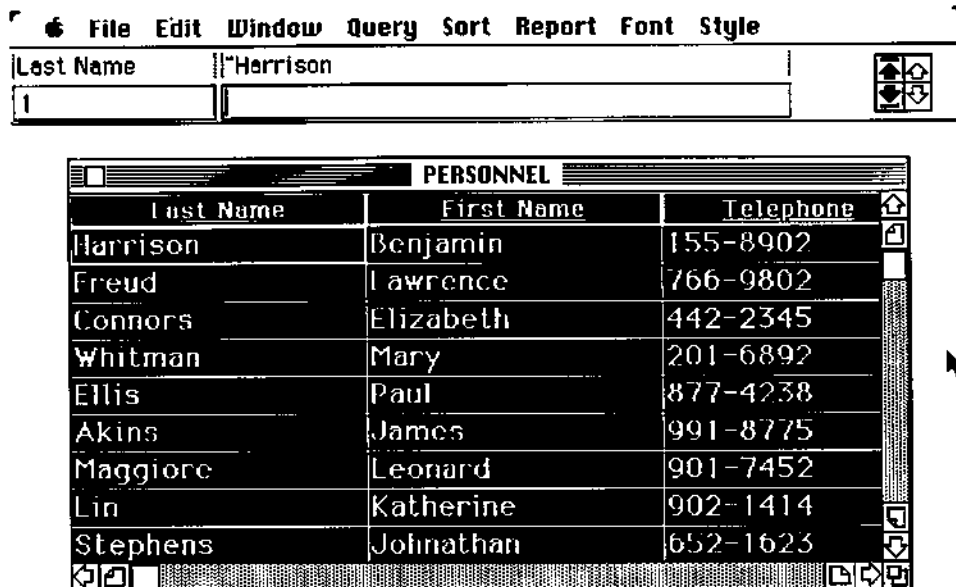


Figure 2.54: 14-Point text selected for printing.

| <u>Last Name</u> | <u>First Name</u> | <u>Telephone</u> |
|------------------|-------------------|------------------|
| Harrison         | Benjamin          | 155-8902         |
| Freud            | Lawrence          | 766-9802         |
| Connors          | Elizabeth         | 442-2345         |
| Whitman          | Mary              | 201-6892         |
| Ellis            | Paul              | 877-4238         |
| Akins            | James             | 991-8775         |
| Maggiore         | Leonard           | 901-7452         |
| Lin              | Katherine         | 902-1414         |
| Stephens         | Johnathan         | 652-1623         |

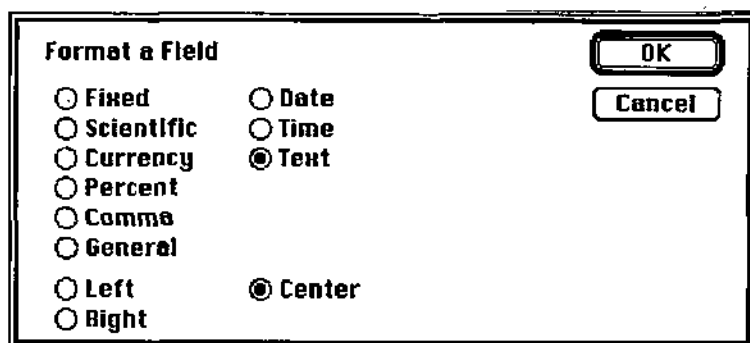
Figure 2.55: Printed records.

Field Format from the Edit menu. Choose Text and Center from the Field Format dialog box, as shown in Figure 2.56. Repeat the sequence to center each set of field values before printing. Type style and size are a matter of convenience and utility, though the more flamboyant combinations are likely to be less useful for keeping database records.

**Saving Database Records** The Save menu, shown in Figure 2.57, provides standard Macintosh choices for storing your work on disk. When you save a database for the first time, you'll be able to replace its default name with a more descriptive one. As you work with a database, it's advisable to use the Save command periodically to update the disk copy. This standard procedure minimizes the work lost should there be a power interruption or other mishap while you're using the computer.

Use the Save As command which brings up the box shown in Figure 2.58, to name database documents and specify which drive to store them on. You can also use it to change a database's name or save it to different disks.

The Revert to Saved command has an effect worth noting. This command removes the changes you've made to the database since last saving it and restores the database to its previous state. You



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Figure 2.56: Field format dialog box.

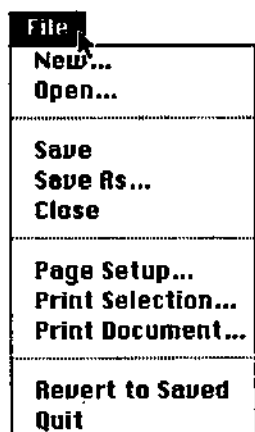


Figure 2.57: Save menu.

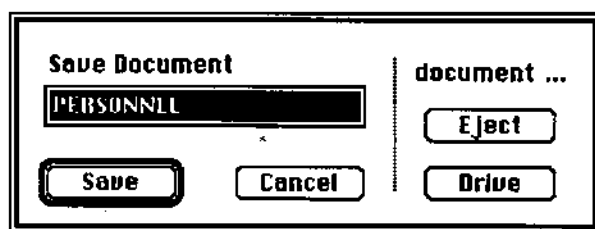


Figure 2.58: Save as Dialog box.

might think of Revert to Saved as a universal Undo command. Before using it, be sure you don't need anything done since the last Save. You'll have a chance to think this over because, before it carries out the command, Jazz takes the precaution of asking you to confirm it in a dialog box.

**Database Use** Saving the database completes a work cycle of data entry and editing. The cycle begins when you set up a new database or open an existing one. It continues through the sequence

of selecting areas to work with, typing values, copying and moving data, printing records, and saving your work. These are the basics of database use.

Jazz has a number of refinements on the basic theme. First among these is the Forms module for data entry. Second are the database Sort and Query commands that arrange and locate information as specifically as you need it. Third are the report commands that extract information from the database and print it on paper in the most useful form. In the rest of this chapter we'll first discuss database forms, then describe how to use the Sort and Query commands. Chapter 3 discusses database reports and the many options available for them.

**D***atabase Forms* It's safe to say that when you see a form, a database can't be far away. How many times have you filled in your name, address, and telephone number on a form? What you're doing, of course, is providing field values for someone's database. Jazz gives you two ways to enter information into a database: by typing directly in the Database window or by completing a form linked to the database. Forms themselves have two aspects: design and use. The Modify Form window shown in Figure 2.59 is the work area for designing forms. Figure 2.60 is called a Use Form window. It's the form actually used for typing information into the database. The form in Figure 2.59 is used to compile a database of personnel who can provide emergency first aid.

**Using Forms** Forms are always linked to databases. As shown in Figures 2.59 and 2.60, forms have entry boxes in which to type information. The entry boxes are labelled with field names of the associated database. Typing information in the entry box automatically adds it to the corresponding field in the database.

The link between databases and forms means that a database should exist before you create forms for it.

The link between databases and forms means that a database should exist before you create forms for it. Once you've set up the database, Jazz automatically prepares a data-entry form that corresponds to it. Figures 2.61 through 2.63 show the sequence for displaying a form for a database named Personnel. Starting at the



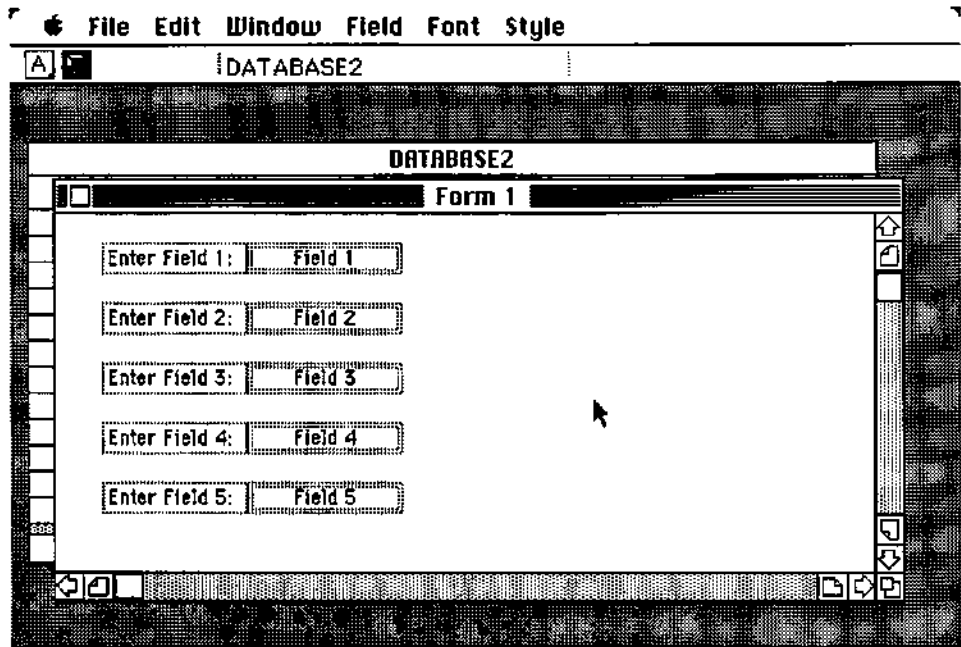


Figure 2.59: Design forms in the Modify Form window.

The screenshot shows a window titled 'CPR FORM'. The text inside the window reads: 'USE THIS FORM TO IDENTIFY CPR QUALIFIED PERSONNEL'. Below this text are four input fields, each with a label and a text box containing data: 'Enter EXTENSION:' with '43', 'Enter LAST NAME:' with 'Jamison', 'Enter FIRST NAME:' with 'Ellen', and 'Enter DEPARTMENT:' with 'Accounting'. The window has a standard Macintosh border with a title bar, a scroll bar on the right, and a toolbar at the bottom.

Figure 2.60: Type data in the Use Form window.

Database window in Figure 2.61, choose New from the File Menu. Then select the Form icon from the Jazz document box in Figure 2.62. Jazz responds by displaying the form shown in Figure 2.63.

Figure 2.63 shows the Use Form window for the Personnel database. When the window opens, it already includes data for the first record in the database—in this example, the record for Benjamin Harrison. The record number, 1, is shown in the record number box at the upper left of the screen. Each box on the form—Last Name, First Name, SSN, Region—corresponds to a field in the database. The form also includes instructions for entering data. As you enter or change information on the form, Jazz changes the database accordingly.

Jazz forms have two uses: data entry and record review. Data entry is simply a matter of typing information on the form to create new records or change existing ones. Record review means using the form to locate and display records.

When you open a form, it appears in the Use Form window, ready for data entry. The Use Form window and the Modify Form

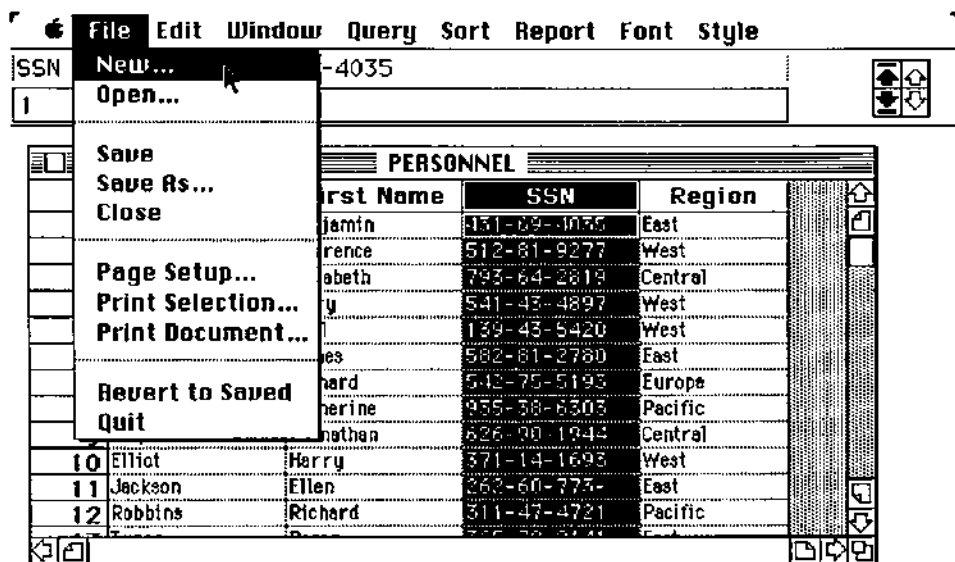


Figure 2.61: Personnel database.

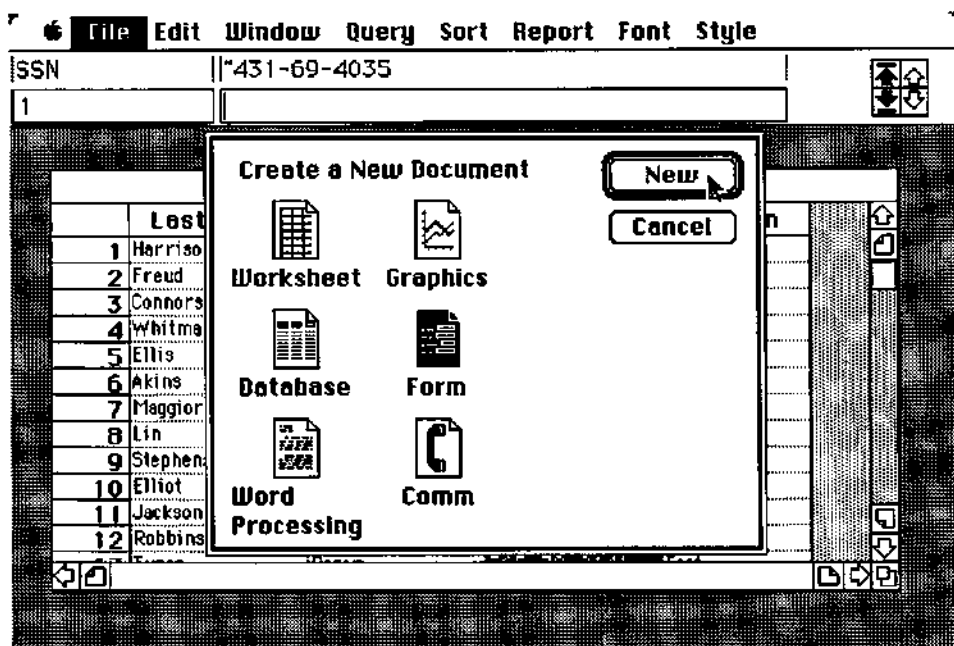


Figure 2.62: Select the Form icon from the Document box.

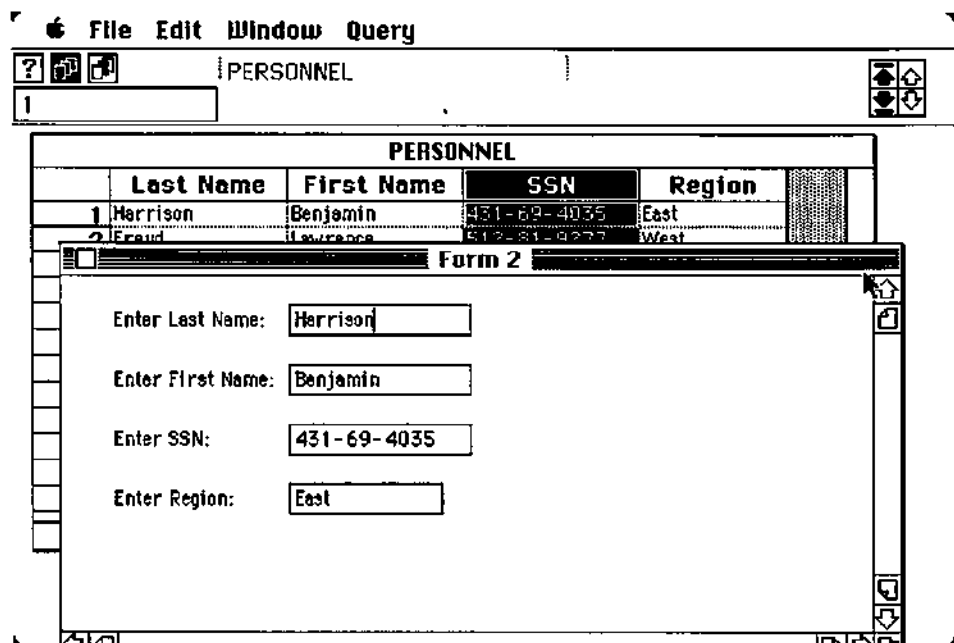


Figure 2.63: The Use Form window.

window are very similar, but the Use Form window has record navigator arrows in the upper right corner. If you want to redesign a form before using it, choose **Modify Form** from the **Edit** menu. Then you can change the form's appearance, add and remove fields, or type instructions for filling out the form. We'll describe various ways to use a form, then see how to modify it.

**Data Entry** Data entry means creating new records or changing old ones. As you complete each entry on the form, Jazz adds the new information to the database. The form shows field values for existing records. Since blank records don't have any field values, the entry boxes on the form are blank.

Data entry with a form takes three steps:

1. Locate an existing record or add a blank record.
2. Type information on the form to add it to the database.
3. Press **Return** to go on to the next record, or choose **Add Record** or **Insert Record** from the **Edit** menu to create a new blank record.

**Locating Records** When you open a form, you'll see the first record in the database. Field values for the record will appear in the individual entry boxes on the form. To see other records, click the record navigator arrows in the upper right corner of the screen or press **Return** to display the next record. Clicking the white navigator arrows moves through the database one record at a time. Clicking the black down arrow moves to the last record in the database. Clicking the black up arrow moves immediately to the first record. You can tell which record you're looking at by checking the record number in the upper left corner of the screen.

If you open a form for a database containing only blank records, the form includes field names and instructions for entering data. Since the database doesn't have any field values, the entry boxes on the form are blank. Again, the record number appears in the upper left corner of the screen. Use the record navigator arrows to move to the record that you want.

Besides working with existing records, you can add blank records to the end of the database or insert them between existing records. Make either choice from the **Edit** menu. Jazz inserts blank records before the record shown in the **Form** window, then renumbers the existing records in the database.

**Typing and Editing** Once you've located a record, click the box where you want to enter data, then type the required information. Use standard Macintosh techniques to edit entries as needed. In Figure 2.64, we've selected the whole social security number for record 3 by dragging across it.

Selecting an entire field value makes the Cut, Copy, and Clear commands available on the Edit menu. These commands have the usual effect on the selected area: Cut removes it from the form and places the selection on the Clipboard, Copy duplicates the selection onto the Clipboard, and Clear erases the selection without copying it onto the Clipboard. In each case, the Edit menu includes an Undo command to restore the selection if necessary. To cancel a selection, click another entry box on the form.

Clicking an entry box places the cursor in it. The Tab key is another way to move the cursor between entry boxes on the form. Holding down the Tab key cycles the cursor through each entry box on the form. As you complete one entry, press Tab to move to the next entry box or press Return to go on to the next record. In either

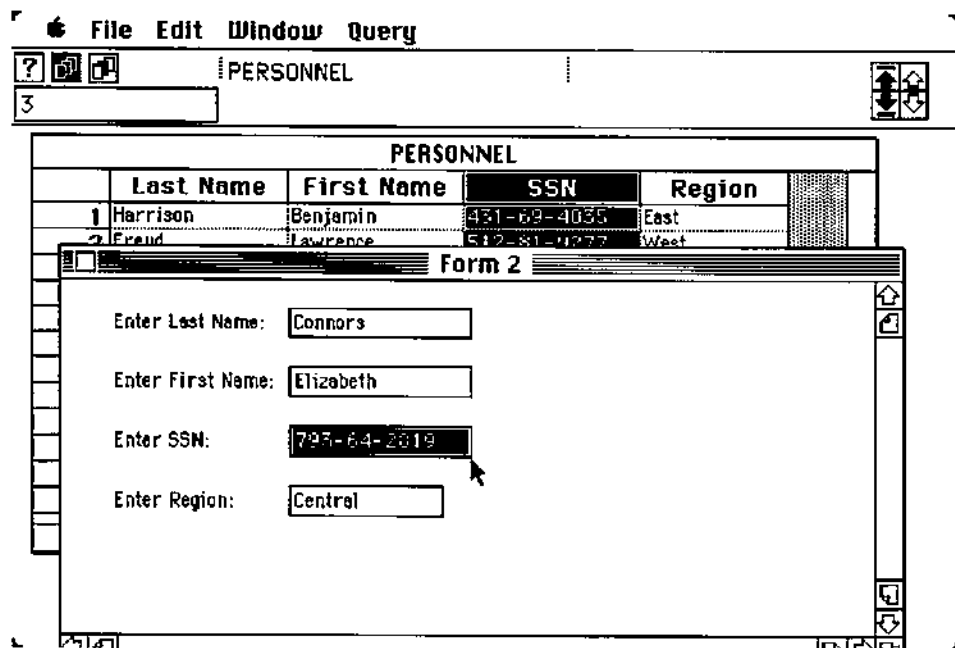


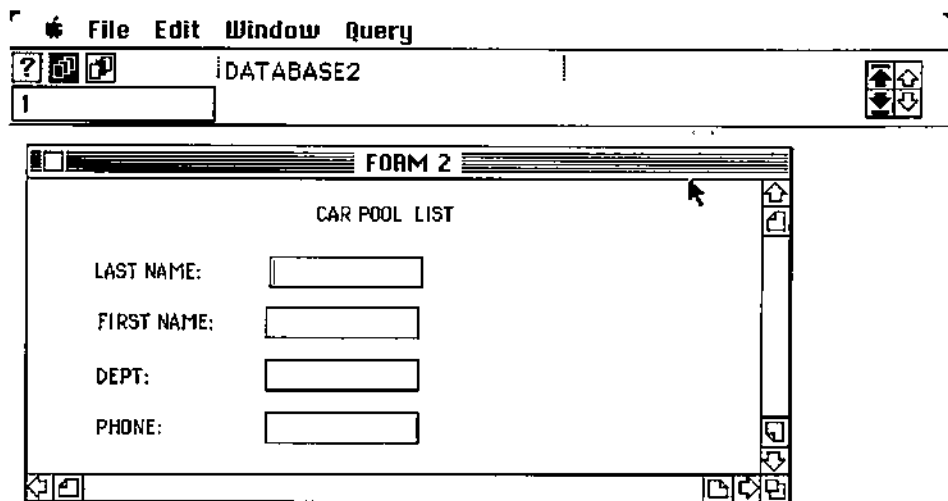
Figure 2.64: A field value selected for editing.

case, Jazz copies the information you've just typed from the entry box on the form to the record in the database.

Before filling out a new record, you'll have to create it by choosing Add Record or Insert Record from the Edit menu. Move the cursor into each blank entry box, then type and edit as usual.

**Updating the Database** After filling out a new record or changing an existing one, press Return to display the next record or use the record navigator to locate the record you want. You also have several choices from the Edit menu at this point. Insert Record and Add Record are available for creating new blank records. Cut Record removes the current record from the database. As usual, the Undo command reverses any of these actions.

It's worth noting that you can use a form without opening its database first. Although the form in Figure 2.65 is the only open document on the desktop, Jazz will add any information you type on the form to the database. You can also use the form as usual to



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**Figure 2.65:** The form can be used while the database is closed.

add blank records to the database or to locate any record. This is a handy technique when all you need to do is update a database.

**Saving Forms** Jazz stores forms as disk files separate from the databases to which they're linked. When you've finished using a form, choose a Save command from the Edit menu to store it on disk. Standard practice is to save each form on the same disk as its database. Otherwise, you'll need to switch disks as you use the form to update or review the database. Give the form a name descriptive enough to tell you the form's purpose. For example, Inventory form is an obvious name for a form linked to your Inventory database.

**Designing Forms** Forms are ideal for routine data entry and record review. Including messages or instructions on a form makes it even easier to use. Once you've set up a database and defined its field attributes, you can design a form for other people to use. A well-designed form will collect the information you want and minimize data entry errors. The form doesn't need to include all the fields in the database. By choosing which fields appear on the form, you can keep other parts of the database private or prevent the data there from being changed by use of the form.

To design a form, you use the Modify Form window. Choosing Modify Form from the Edit menu changes the active window from Use Form to Modify Form.

Figure 2.66 is the Modify Form window with its associated database, CPR List. Both field names and entry boxes are outlined by dotted lines. The single-boxed lines are notation boxes. The double-boxed areas are field names from the database. These correspond to the data-entry areas in the Use Form window. Figure 2.66 also shows two new icons in the upper left corner of the screen. The [A] icon is called the notation well. It's used to modify the text that appears in the notation boxes. The icon next to the notation well is the anchor well, which is used to add new fields to the form.

The Modify Form window allows several kinds of changes to a form. Use it to:

- Rearrange items.
- Type messages and instructions.
- Add and remove fields.
- Change type style and size.
- Lock and unlock fields.

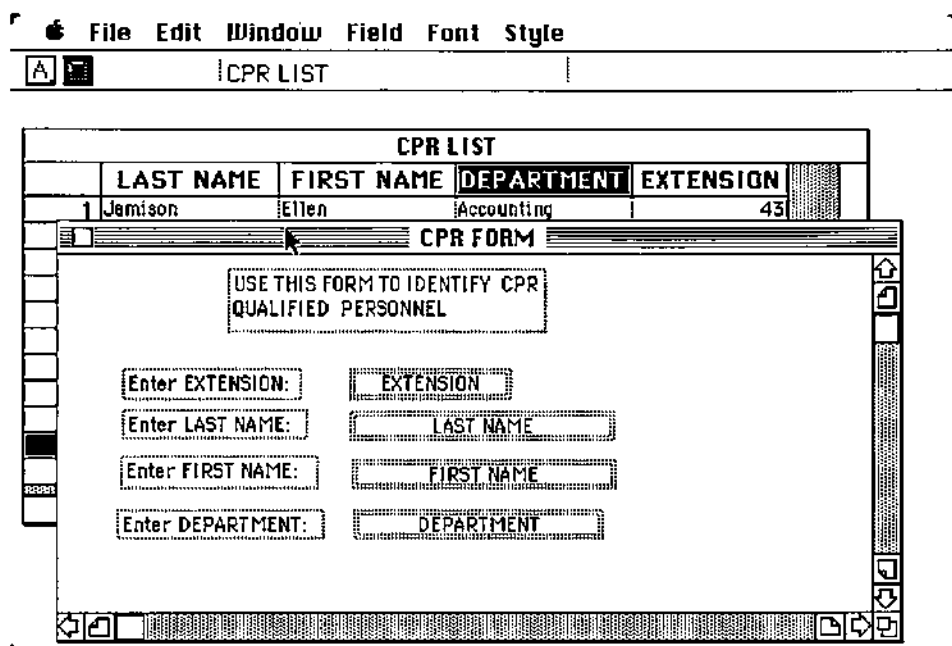


Figure 2.66: Modify Form window.

**Rearranging Forms** Both the notation boxes and the data-entry boxes can be moved anywhere on the form. To move a box, position the cursor on the dotted border and drag the box to where you want it. The text won't move as you drag the box. When you release the mouse button, Jazz transfers the text into the box at its new location. The location of notation boxes and messages is completely at your option. Field names, for example, need not appear in the same order as in the database. When you use the form for data entry, Jazz copies the information into the correct field. Figure 2.67 is a rearranged version of the form in Figure 2.66.

**Adding Messages and Instructions** Forms automatically include instruction boxes and data-entry boxes for each field in the database. One way to make a form easier to identify and use—especially for someone unfamiliar with the database—is to add supplementary messages or instructions to the form.

To change the text in an instruction box, select the box by clicking anywhere inside it. Jazz changes the dotted lines around the box to solid lines, as in Figure 2.68, and adds a size box to the lower right



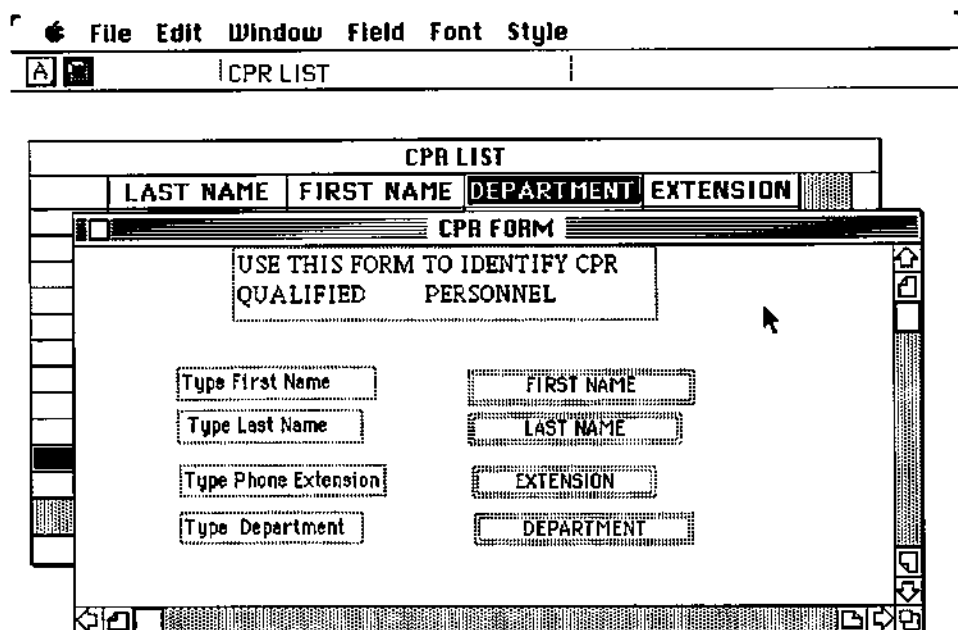


Figure 2.67: Rearranged form.

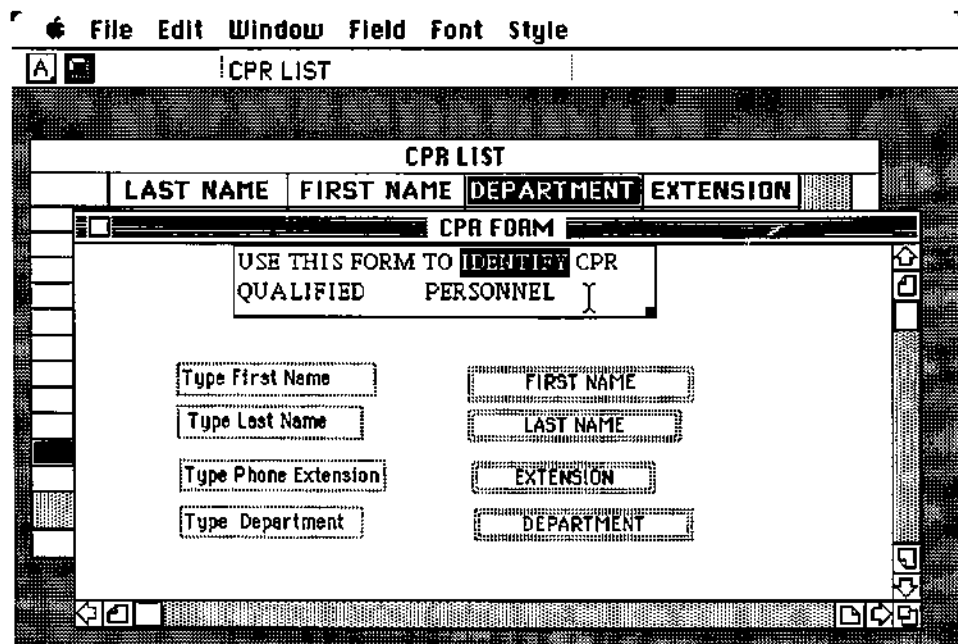


Figure 2.68: A selection for editing.

corner. The flashing cursor inside the instruction box means you can type and edit the text using standard Macintosh editing techniques. In Figure 2.68, we've dragged across the word *identify* prior to editing it.

The Edit menu includes the usual choices for editing the selection (Cut, Copy, Clear, etc.). You can also shrink or enlarge the message box by dragging its size box. In Figure 2.69 we've dragged the message box to enlarge it. The size of a message box depends on the text you intend to type in it, up to a maximum of 254 characters.

To add new message boxes to the form, click the notation well, then drag the cursor diagonally across the form to outline the new box. When the box is in place as you want it, release the mouse button, then type and edit in the new box as you would in any message box. We've outlined a new message box in Figure 2.70.

Jazz's font and style choices are available for the messages and instructions you add to a form. A little experimentation will give you effective forms that are easy to read and minimize errors. The general rule is to design forms that are uncluttered and that highlight

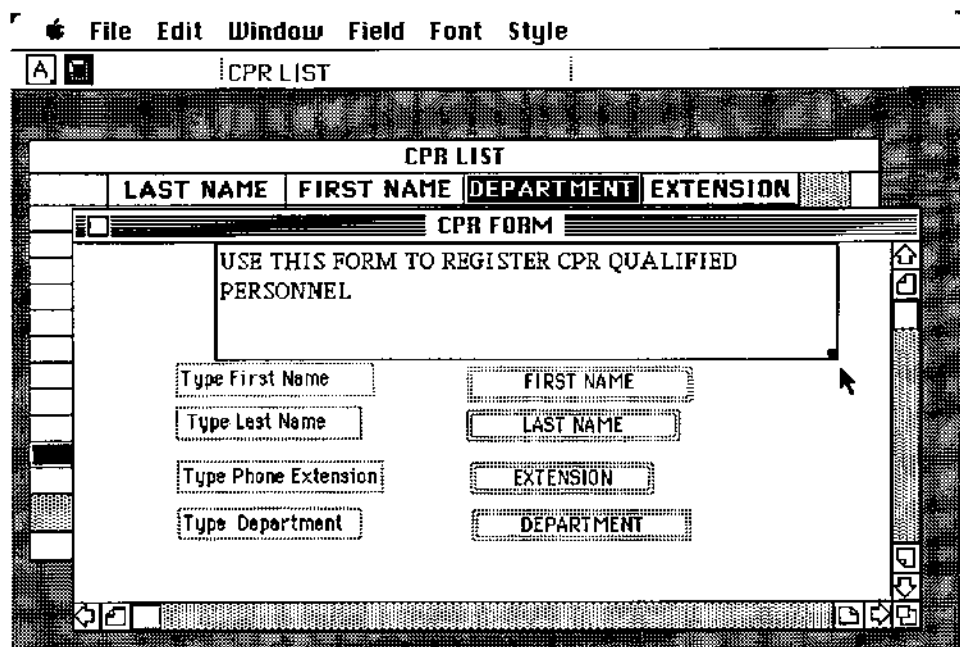


Figure 2.69: Enlarging a message box.

the information that you want as clearly as possible. The form shown in Figure 2.71 uses a combination of type styles and sizes.

Any message or notation box can be erased from the form by selecting it and choosing Clear from the Edit menu.

**Adding and Removing Fields on a Form** When you open a form, it includes instruction and entry boxes for each field in the database. Besides rearranging these items on the form, you can use the Modify Form window to add new fields or remove existing ones. To remove a field from the form, select it and choose Clear from the Edit menu. Jazz erases the field from the form, but not from the database. Erasing a field is a convenient option when you want the form to be used for data entry into some fields of the database rather than all of them. The Database window does not have to be open when you erase a field from a form.

Adding a field to a form requires that you open both the Modify Form window and the database. The technique involves selecting a field name in the Database window, deciding where you want

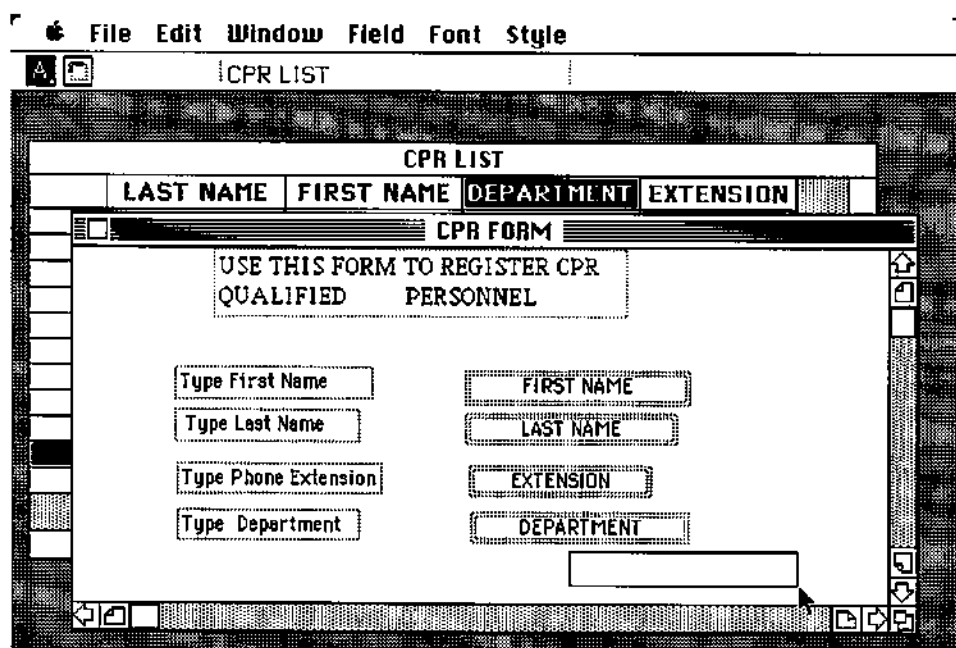


Figure 2.70: Adding a message box.

the field on the form, then copying it over from the database. It's a simple procedure that uses the anchor well on the console line and the Place command on the Field menu, shown in Figure 2.72.

Start by selecting the field name in the Database window, click the Modify Form window to activate it, and then click the anchor well. Place the cursor where you want the new field name to appear on the form and click. Jazz places an anchor onto the form at the cursor position. This is where the field will appear when you add it to the form. Choosing Place from the Field menu copies the field onto the form, as shown in Figure 2.73.

Once the new field is on the form, you can edit the instruction box in the usual way or change its position by dragging it. If you decide to remove the field for some reason, select it and choose Clear from the Edit menu. The Modify Form window gives you considerable freedom in form design. In general, everything on the form can be written and arranged as you want it.

The Field menu also includes commands for locking and unlocking fields on a form. To lock a field, click its entry box and choose Lock from the Field menu. Locking a field on a form means the form

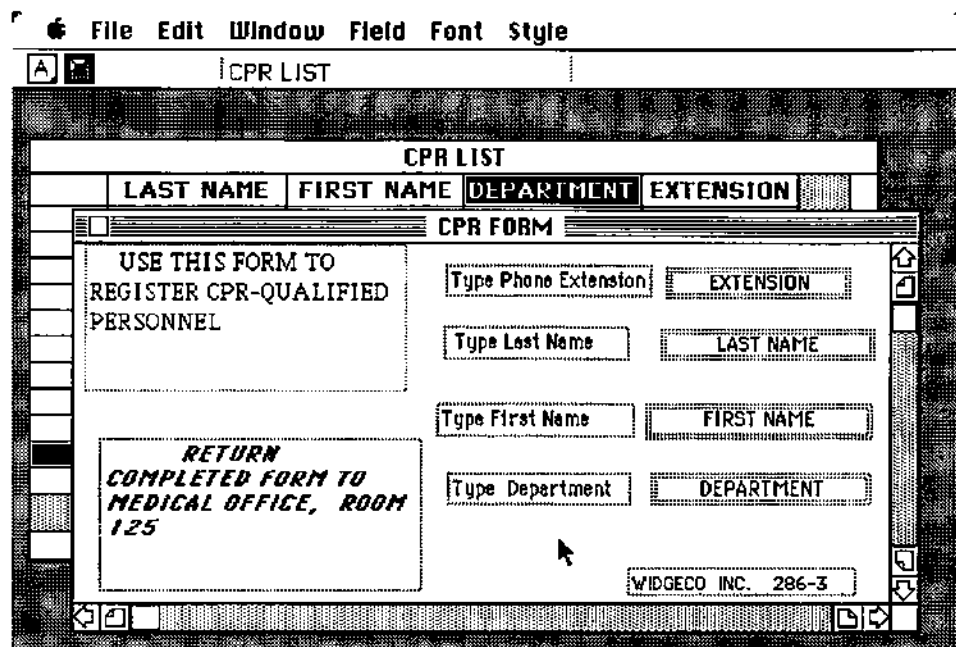


Figure 2.71: Type size and style emphasize messages.

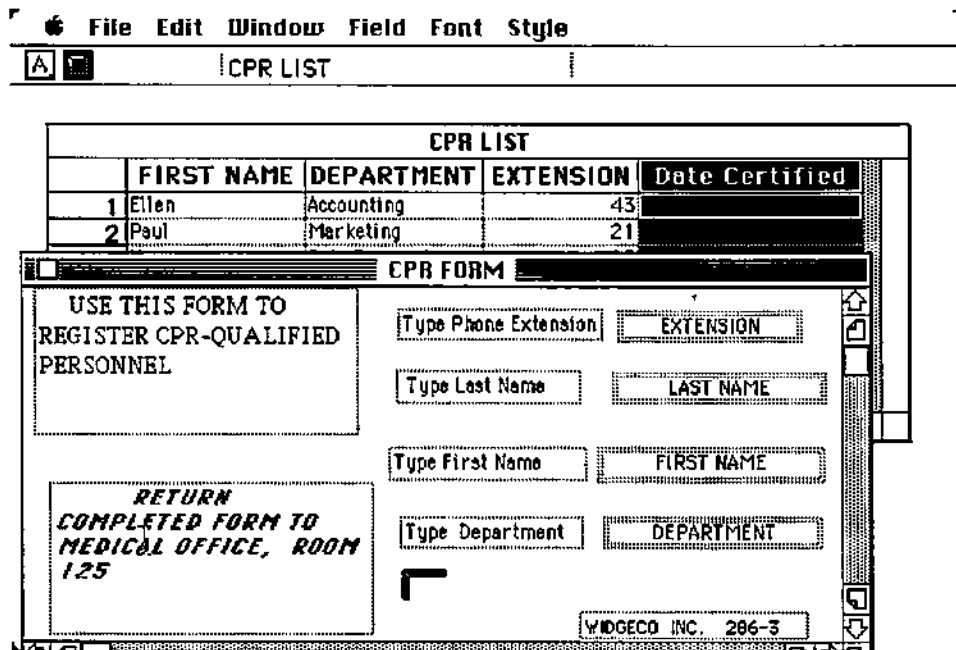


Figure 2.72: The anchor well and Field menu.

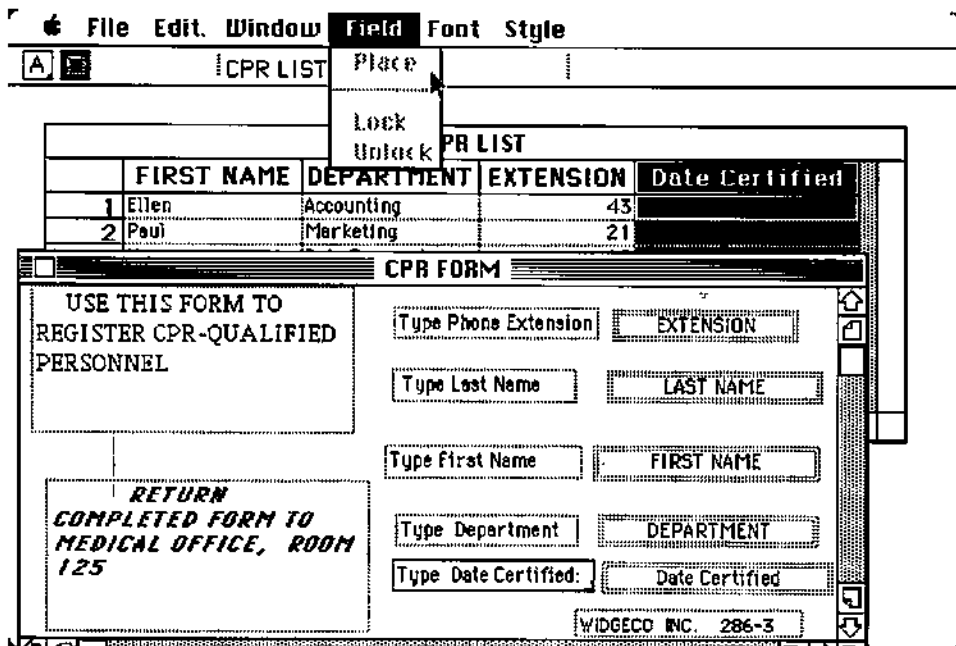


Figure 2.73: Adding the selected field to a form.

can't be used to enter new values or change existing ones for that field. However, the field is locked only on the form. You can still enter and change information directly in the database. To lock a field both on the form and in the database, use the Field Attributes box in the database.

To unlock a field, click its entry box and choose Unlock from the Field menu. Again, you can't use the form to unlock a field that has been locked in the database. In this case, use the Field Attributes box to unlock the field.

Usually, you won't use or modify a form until after you set up its database. You can open a form that's not linked to a database, but the form won't include any fields. The form will be in what Jazz calls Edit mode, with the same editing options as are available in the Modify Form window. Since the form isn't linked to a database, it's useful for practicing form design but not for data entry.

**Printing a Form** Jazz designs forms electronically, but people usually fill them out on paper. Once you've arranged the form as you want it, use the Print commands on the File menu to print blank forms or actual records from the database. To print a record, display it in the Use Form window and choose Print Current from the File menu.

To print a blank form for use on paper, open the Use Form window and choose Add Record from the Edit menu. The window will show a blank record at the end of the database—messages, instructions, and entry boxes, but no field values.

Choose Page Setup from the File menu to check the printer settings, then choose Print Current. Select the print quality you want from the Print dialog box and click OK. Jazz prints the blank form, as shown in Figure 2.74. Once the form is printed, you can duplicate and distribute it for people to fill out.

**Using the Database: Sort and Query** Once you've set up a database and begun to accumulate information, it's important that you be able to organize and locate data as you need them. The commands on the Query and Sort menus are tools for this purpose. Sort rearranges all the records in the database in the order that you specify. You can add records in any order, then rearrange

USE THIS FORM TO  
REGISTER CPR-QUALIFIED  
PERSONNEL

Type Phone Extension

Type Last Name

Type First Name

**RETURN**  
**COMPLETED FORM TO**  
**MEDICAL OFFICE, ROOM**  
**125**

Type Department

Type Date Certified

WIDGECO INC. 286-3

Figure 2.74: Print out a blank record and use it as a form.

them in alphabetical or numerical order as needed. Query locates records that satisfy the criteria that you have defined. This means you can extract, review, and work with specific sets of records in the database. Sort and Query are steps in the work cycle that follow setting up the database and data entry.

**Sorting Database Records** Before you can sort a database, you must specify the fields Jazz should use to make the sort. These are called sort fields. Jazz sorts the database by checking the sort fields in each record, then putting the record in alphabetical or numerical sequence. You specify sort fields in the dialog box shown in Figure 2.75. To display this box, open a database and choose Set Fields from the Sort menu.

The Sort Fields box has entry areas for three sort fields, each of which must be the name of a field in the database. To specify a sort field, click the entry area and type the field name. As the first sort field, type the first field you want used for the sort. If, for example, you want the database sorted by company name, type

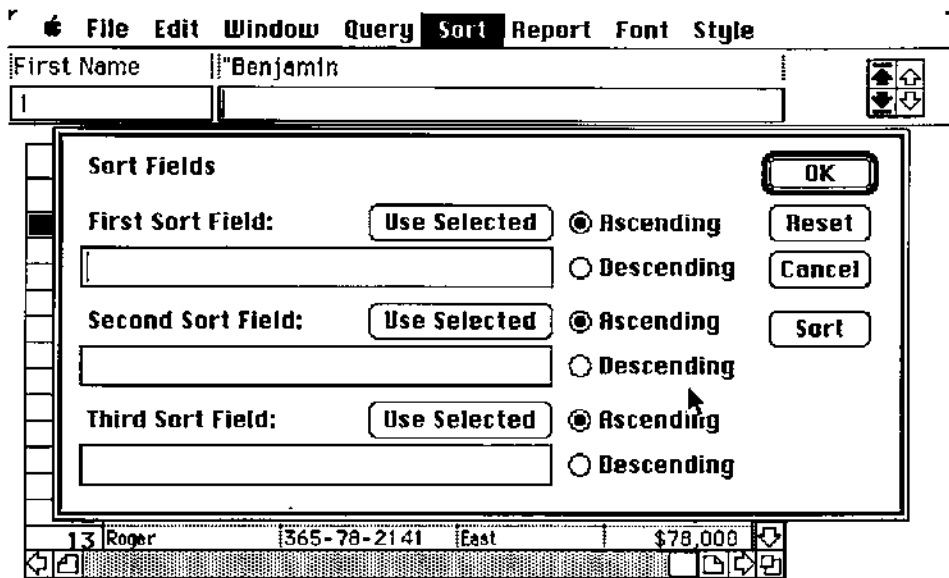


Figure 2.75: Sort Fields Dialog box.

company name in the box under First Sort Field (of course, company name must be one of the fields in the database). Use standard Macintosh techniques to edit the field name as needed.

The second and third sort fields add options to the sort. With company name as the first sort field, you might specify order date in ascending order in the box under Second Sort Field and amount payable in descending order in the box under Third Sort Field. A sort using these fields would give you an alphabetical list of companies, with the oldest order date and largest amount payable as the first record.

All field values in the database are either letters or numbers. You can specify ascending order (A to Z for letters; 1, 2, 3 . . . for numbers) or descending order for each sort field by clicking the settings in the Sort Fields box. After specifying sort fields and sorting order, you have the choice of sorting directly from the dialog box or clicking OK to save the settings without sorting, then return to the Database window. To make the sort from the Database window at any point, choose Sort from the Sort menu. Choosing Reset erases current settings, while Cancel closes the dialog box and returns you



to the Database window. Figure 2.76 shows part of a database sorted in ascending order by last name.

An alternate way to specify sort fields is to select them one at a time in the database before opening the Sort Fields box. This technique is sometimes faster than typing field names. Select the first sort field by clicking its name, then choose Set Fields from the Sort menu. The name will appear under the First Sort Field in the dialog box. Choose Use Selected to sort the database or close the box and select the second sort field from the database.

You can sort a database as often as you wish, using whatever sort fields are convenient for your purpose. Sorting is an organizational task that can give you a better grasp of the information in a database. It's also the first step in preparing database reports, as described in Chapter 3. While sorting is a way to organize information, querying is the way to locate information when you need it.

**Database Queries** As you add records to a database, it can easily grow to include thousands of separate items of information.

File Edit Window Query Sort Report Font Style

Last Name: Adams

1

| SALES STAFF |           |            |             |         |
|-------------|-----------|------------|-------------|---------|
|             | Last Name | First Name | SSN         | Region  |
| 1           | Adams     | Samuel     | 689-75-1730 | Pacific |
| 2           | Akins     | James      | 582-81-2780 | East    |
| 3           | Allen     | Thomas     | 293-31-0209 | West    |
| 4           | Almasa    | Robert     | 577-10-9647 | Europe  |
| 5           | Alpers    | Nancy      | 452-67-3050 | West    |
| 6           | Caffray   | Paula      | 594-01-9252 | Central |
| 7           | Callahan  | MaryEllen  | 925-66-3813 | West    |
| 8           | Castle    | Robert     | 927-01-5595 | Central |
| 9           | Coffey    | Eleanor    | 770-46-5329 | East    |
| 10          | Connors   | Elizabeth  | 793-64-2819 | Central |
| 11          | Cook      | Patrick    | 787-23-0845 | Central |
| 12          | Dixon     | Ronald     | 814-52-2641 | West    |
| 13          | East      | Deborah    | 638-92-1038 | Europe  |

Figure 2.76: Last Names sorted in ascending order.

It's useful to have all these data organized, classified, and under control in a database. But how do you find specific information? Suppose you want to find the name and address of everyone who bought more than \$500 worth of goods from last year's catalog, or how many books in the library are more than 30 years old, or the average test scores in physics of this year's sophomores. Database queries are the answer.

One great advantage of a database is that once you organize information, it's no problem to look at it in different combinations and from various perspectives. Database queries are tools for analyzing information. You use them to specify criteria and find records that match them. Queries are another way to make information in the database the basis for evaluation, decision, and action.

Jazz provides two techniques for finding information with a query. One, called database query, uses the Query menu in the Database window. The other, called form query, uses the database form to find specific records. We'll describe database query first, then form query.

**Query Definitions** Database queries—searches through the database for specific records—are based on query criteria. Making a query means searching through the database to find records that match the criteria. You define these criteria for each search, and Jazz stores the definitions so that you can use them again without having to redefine them.

When you open a database, Jazz creates a blank query definition for it. To see this definition, choose Show Definition from the Query menu. Jazz responds by opening a Query Definition window for the active database. Figure 2.77 shows a database named Sales Staff with a Query Definition window named Sales Staff: Query 1 in front of it.

The Query Definition window looks much like the database itself, except that the field columns are blank. Each field in the database appears in the query definition. The fields correspond exactly because search criteria are defined by field. Follow these steps to develop the search criteria:

1. Select a cell in the Query Definition window.
2. Type the value you want to find in the database.
3. Select the next field and type a value.
4. Repeat the sequence until you've specified all the values that you want to find.

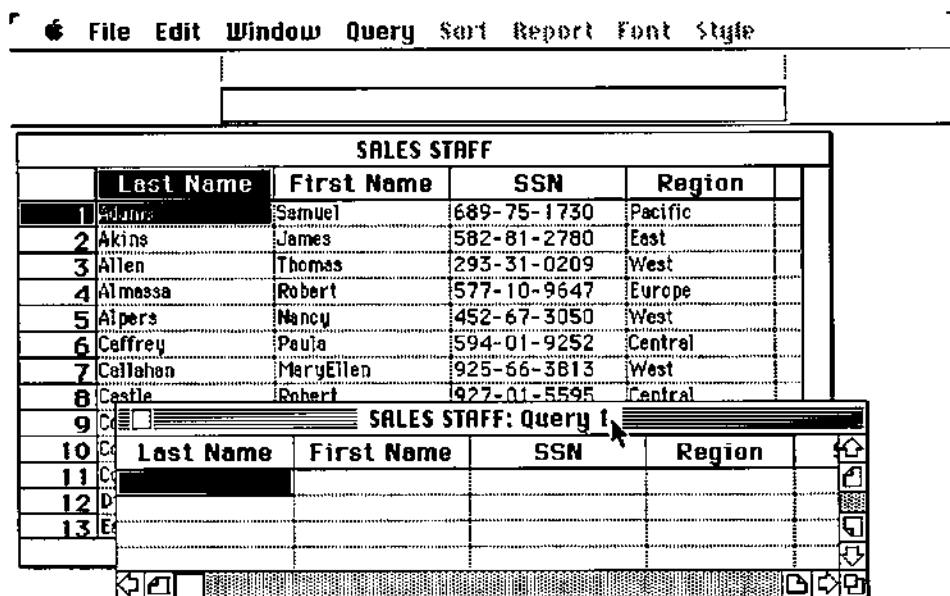


Figure 2.77: Database and Query Definition window.

The set of values you've specified is the query criteria. In Figure 2.78, we've specified one search criterion in the Region field. The criterion means: "Select all records with West as the value for Region."

Defining criteria doesn't actually carry out the search. You do that by choosing **Select with Criteria** from the **Query** menu. Jazz selects all records in the database that match the criteria that you've defined. Once the records are selected, you can review them in the database or use any editing command to work with them. Often the next step is to copy the selected records onto the Clipboard prior to pasting them into another document. Figure 2.79 shows some of the records that met the Western region search criterion listed in Figure 2.78.

The rules for selecting, typing, and editing values in the Query Definition window are the same as those for the database itself. Use standard Macintosh editing techniques to change values, and use the mouse or Return or Tab keys to move between cells.

Query definitions range from a single criterion as in Figure 2.78 to more complex criteria that combine field values with arithmetic and

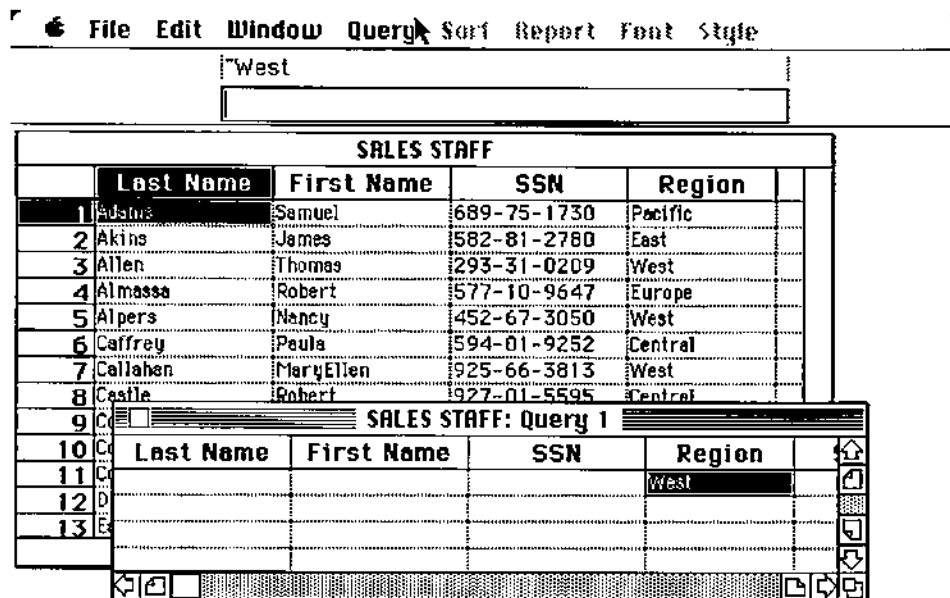


Figure 2.78: Single search criterion for Region.

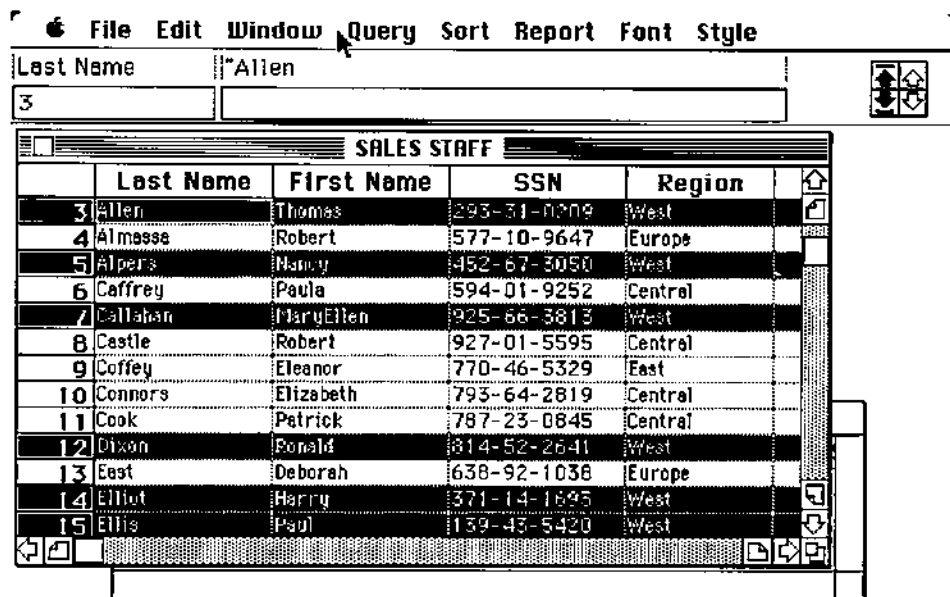


Figure 2.79: Selected records meet the Search criterion.

logical operators. This means that you can define very precise database searches. So, search criteria can include:

- **Text**—field names, field values from the database, or other text.
- **Numbers**—field values from the database or other numbers.
- **Arithmetic and logical operators**—less than or equal to ( $\leq$ ), less than ( $<$ ), greater than ( $>$ ), and greater than or equal to ( $\geq$ ).
- **Formulas and conditional statements**—AND, OR, and =.
- **Wildcards**—the question mark (?) representing any letter in a criterion and the asterisk (\*) representing any group of characters.

**Specifying Query Criteria** The search criteria in Figure 2.80 combine three of these elements: two text values in the Region field and the less-than arithmetic operator ( $<$ ) in the Sales field. The criteria mean: "Select all records in the Central region with sales less than \$150,000 and all records in the Eastern region."

There are several things to notice about this query definition. The field value for Sales, 150000, doesn't include a dollar sign or comma, although both are used in the database. Since these format characters were specified in the Field Attributes box when you set up the database, it isn't necessary to repeat them when typing a query criterion. In fact, using a format character in a numerical or formula criterion will display an Invalid Formula dialog box. If this happens, go back to the criterion you've typed and erase the formatting character.

| SALES STAFF |           |            |             |         |     |
|-------------|-----------|------------|-------------|---------|-----|
|             | Last Name | First Name | SSN         | Region  | S   |
| 1           | Harrison  | Benjamin   | 431-69-4035 | East    | \$1 |
| 2           | Freud     | Lawrence   | 512-81-9277 | West    | \$1 |
| 3           | Connors   | Elizabeth  | 793-64-2819 | Central | \$1 |
| 4           | Whitman   | Mary       | 541-43-4897 | West    | \$  |
| 5           | Ellis     | Paul       | 139-43-5420 | West    | \$  |
| 6           | Alkins    | James      | 582-81-2780 | East    | \$1 |

| SALES STAFF: Query 1 |            |     |         |         |  |
|----------------------|------------|-----|---------|---------|--|
| Last Name            | First Name | SSN | Region  | Sales   |  |
|                      |            |     | Central | <150000 |  |
|                      |            |     | East    |         |  |
|                      |            |     |         |         |  |
|                      |            |     |         |         |  |

Figure 2.80: Combining criteria.

Notice, too, that the query criteria in Figure 2.80 are typed in different rows. When you specify field values in several rows of the Query Definition window, Jazz finds all the records that meet the criteria in any row.

**Using Formulas in Query Definitions** We can define more elaborate search criteria by using wildcards and logical operators. Wildcards substitute for specific characters in a field value. Logical operators define additional conditions that records must meet. Using the database in Figure 2.80, suppose you wanted to find the records of everyone in the Pacific region whose last name begins with M. One way to do it is to enter "M\*" in the Last Name field and Pacific in the Region field. Another way is to write the formula = "M\*"#AND#Region= "Pacific", as shown in Figure 2.81.

The formula has several elements, each of which plays a part in the query definition:

- The equal sign (=) identifies what follows as a formula. When writing a formula, start it with an equal sign.

File Edit Window Query Sort Report Font Style

= "M\*"#AND#Region= "PACIFIC"

| SALES STAFF |           |            |             |         |           |
|-------------|-----------|------------|-------------|---------|-----------|
|             | Last Name | First Name | SSN         | Region  | Sales     |
| 1           | Harrison  | Benjamin   | 431-69-4035 | East    | \$105,000 |
| 2           | Freud     | Lawrence   | 512-81-9277 | West    | \$120,000 |
| 3           | Connors   | Elizabeth  | 793-64-2819 | Central | \$155,000 |
| 4           | Whitman   | Mary       | 541-43-4897 | West    | \$92,000  |
| 5           | Ellis     | Paul       | 139-43-5420 | West    | \$80,000  |
| 6           | Akins     | James      | 582-81-2780 | East    | \$147,000 |
| 7           | Maggiore  | Leonard    | 542-75-5193 | Europe  | \$135,000 |

SALES STAFF: Query 1

| Last Name                    | First Name | SSN | Region | Sa |
|------------------------------|------------|-----|--------|----|
| = "M*"#AND#Region= "PACIFIC" |            |     |        |    |

Figure 2.81: A formula criterion.

- "M\*" is the first condition that the records must meet. It means last name beginning with M and having any other characters. The wildcard (\*) represents all the characters following M in the name. In formulas, text other than field names must be enclosed in quotation marks.
- #AND# is a logical operator between two conditions. It specifies "records that meet the preceding condition AND the following condition." Jazz also uses the logical operator OR to specify "records that meet the preceding condition OR the following condition."
- Region="Pacific" is the second condition that the records must meet. It specifies records for the Pacific region. Since Pacific isn't a field name, it's enclosed in quotation marks.

Formulas are a condensed way to write query definitions that you could also specify by typing field values separately in the Query Definition window. Once you've defined the criteria, the effect is the same either way.

Use standard Macintosh techniques to edit formulas as needed. Choose Open Cell from the Edit menu and edit the formula as you would any cell entry. To erase a formula or cell value completely, click to select it and choose Clear from the Edit menu.

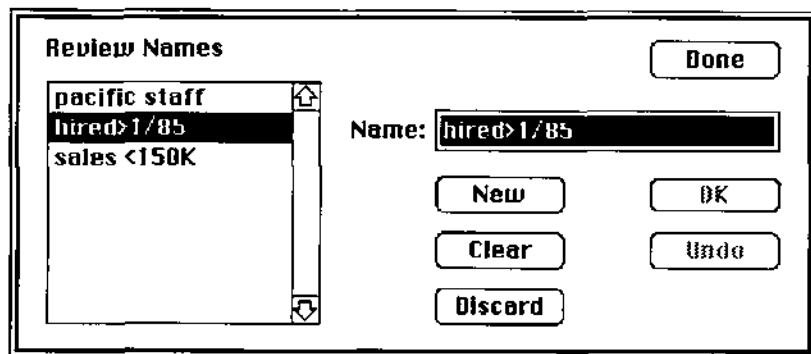
**Searching the Database** After defining query criteria, you have the option of searching the database immediately or saving the definition for later use. To search the database, choose Select with Criteria from the Query menu. Jazz makes the Database window active and selects the records that match the current query definition. You can remove duplicate records from the selection (but not from the database) by choosing Drop Duplicates from the Query menu. Work with the records as you do with any selected area of the database.

It would be tedious to define the same query criteria each time you wanted to make a specific search of the database. Jazz avoids this problem by letting you save query definitions for each database and use them again or modify them as needed. When you set up a database, Jazz associates a blank query definition with it and names it Query 1. For example, the Query Definition window for a new database named Inventory is called Inventory: Query 1.

**Saving Query Definitions** As a database grows and changes, you're likely to develop an entire set of query definitions that you'll repeat for periodic searches. You can name and store each of these query definitions using the Names command on the Query menu. To save a set of query criteria, choose Names from the Query menu. Jazz responds with the Review Names dialog box shown in Figure 2.82.

The Review Names box for a new database will list one query, the blank Query 1. You should rename this query to something more descriptive when you create the first query definition for the database. Figure 2.82 lists three queries that have been defined for a Sales Staff database: **pacific staff** selects records for the Pacific region, **hired>1/85** selects records of people who were hired after January 1985, and **sales<150K** identifies people whose sales totals are less than \$150,000. These queries, like any others, can be used individually or in sequence. The query names immediately tell you the purpose of the query. The Review Names box keeps track of the queries defined for each particular database.

**Adding and Modifying Query Definitions** The Review Names box lists all the queries associated with a database. To activate a specific query definition, select it in the dialog box and click done. Jazz will display the Query Definition window. To add a new query to the list, click Name, type the name you want to use, and click Done. Jazz responds with a Query Definition window in which you can define new search criteria. You can change the name of an existing query by selecting it and typing the new name. If you decide to



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**Figure 2.82:** Use the Review Names dialog box to name query definitions.



erase a query definition, select it from the Review Names box and click Discard.

Query definitions are a customized set of tools for looking at a database. They find information quickly, in the most useful or frequently needed form.

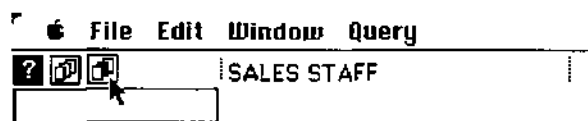
**Form Queries** Form queries are a way to specify search criteria and view the matching records one at a time in the Use Form window. Instead of typing values in the Query Definition window, you specify them in the field boxes on the form. Since the criteria can't be saved, however, form queries are useful for quickly specifying individual queries, not for developing a set of queries.

Start by opening or creating a form for the database you want to search. Check the Edit menu to be sure you're using the Use Form window. When the Use Form window is active, Modify Form will be one of the choices on the Edit menu.

To prepare a form query, click the Query icon [?] on the console line or choose Define Criteria from the Query menu. The form will look much the same as it did, except that the field boxes are empty and the form has a title such as Form 1: Query. Specifying search criteria is just a matter of typing field values on the query form. The same rules apply here as for the Query Definition window.

Select the field in which you want to specify criteria and type a value. Search criteria can include text, numbers, logical and arithmetic operators, formulas, and wildcards. Typing values for more than one field on the query form is equivalent to typing several values on the same row of the Query Definition window. Defining value for more than one field specifies records that match each criterion. To change a criterion or add new ones, click the appropriate field and type the new value. In Figure 2.83, we've specified a search for records in the Central region that have sales greater than \$120,000.

Once you've defined the criteria, you can make the search in either of two ways: choose View Matching Records from the Query menu or click the Matching Record icon on the console line. Jazz locates and displays the first matching record in the database. Click the record navigator arrows to display the other records selected. The white navigator arrows move forward and back one record at a time. The black navigator arrows move up to the first matching record and down to the last record. You can edit or change any displayed value by selecting it and using standard Macintosh techniques.



When you've finished looking at the matching records, choose View All Records from the Query menu. This restores the selected records and displays the first record in the database. To make a search using other criteria, repeat the sequence: click the Query icon, type the new criteria on the form, and again choose View Matching Records.

Searching for information is one of the things you'll do most frequently in the database. Having found the data that you want, there are various ways to incorporate it for use in other Jazz modules.

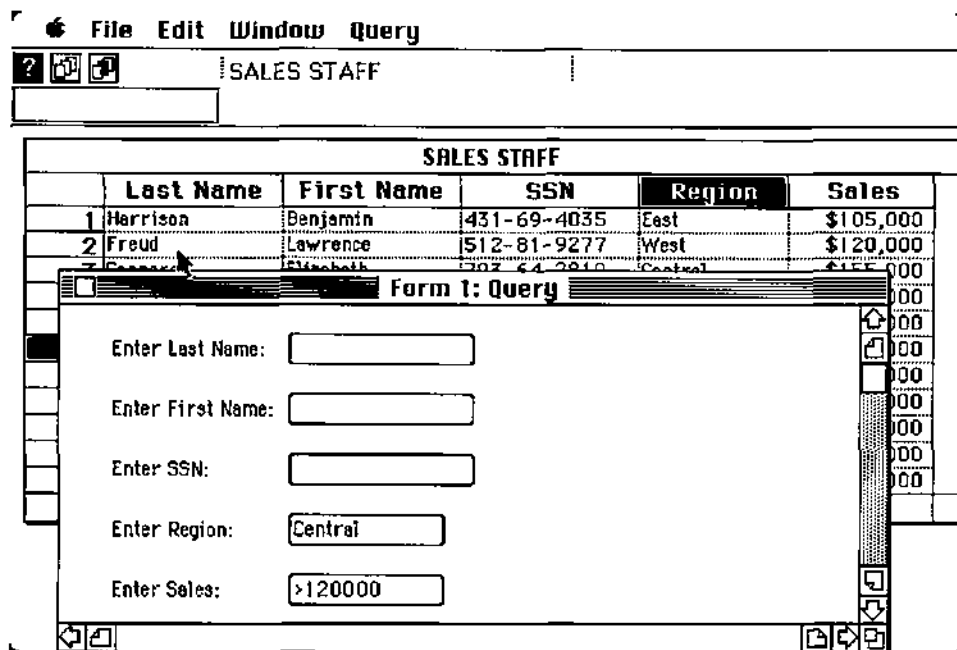


Figure 2.83: Specifying a form query.

**Working with Other Jazz Modules** A database by itself is a storehouse of information, but the storehouse isn't locked. There are several ways to get information in and out: directly through the database module described in this chapter, or through other Jazz modules, particularly the worksheet, graphics, and communications modules.

**Database and Worksheet** Oftentimes, database information is raw material for worksheet analysis. Conversely, the database can be used to store results of worksheet calculations. Transferring data between the worksheet and database is just a matter of cut and paste or copy and paste. You simply select the material you want to transfer in one document, cut or copy it to the Clipboard, open the other document, and paste it in.

There are, however, two requirements when transferring material from the worksheet to the database: (1) set up as many fields as required to accommodate the information and (2) select an area large enough for the data that you're pasting. Jazz pastes only as much worksheet data as will fit in the area that you've selected. Any data that won't fit aren't pasted. If you've cut—rather than copied—the data from the worksheet, you won't be able to recover it.

Jazz displays pasted material in whatever format you've specified for the database fields. Existing field values will be overwritten if you have not protected them. Both the database and the worksheet accept formula entries. When pasting material from the worksheet, be careful not to inadvertently overwrite existing formulas.

**Database and Graphics** Graphs clarify and give visual impact to the information in a database. There are two ways to use database selections in a graph: as range values or as labels along the axis. The only proviso in graphing database values is that all the values on a particular graph must be selected from the same field. You can't select values from different fields and draw them as one graph.

Chapter 5 has details about the different graphs available in Jazz and the enhancements you can make to them.

Once you've saved a graph that uses database values, Jazz links the graph to the database. As with any linked document, you should keep the associated graph and database on the same disk.

**Database and Word Processor** To transfer information from the database to a word processor document, select the area you want to move, then cut or copy it to the Clipboard. You can cut and copy field values and records individually or in groups, but fields can be cut or copied only one at a time. Next, switch to the word processor document. Check the margins to be sure they're wide enough for the data that you're pasting and set tabs for each field column. When the tabs are in place, click the cursor at the place where you want the data to appear, then choose Paste from the Edit menu. Jazz will transfer the selected data without including record numbers or grid lines. Figure 2.84 shows several columns of data that were transferred from a database.

Tab settings are important when transferring information into a document because they define where field values begin and end. Set tabs to correspond to each field and display width. If the pasted data look garbled or incorrectly formatted, chances are the tabs aren't set correctly. Adjust them until the pasted data look as they should. Once the material is pasted into the document, it becomes word processing text that can be edited in the usual way.

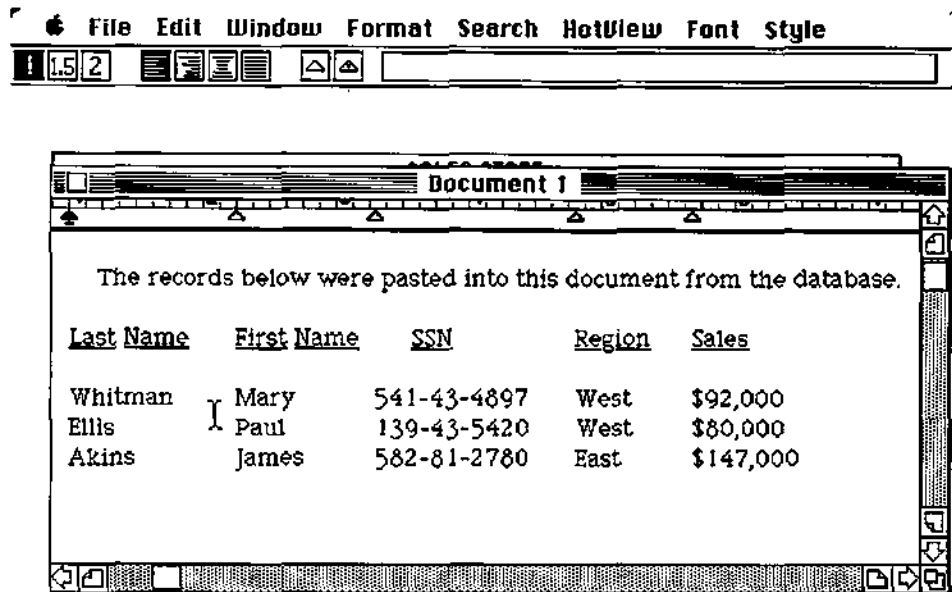


Figure 2.84: Records copied from a database to a word processing document.

**Transferring Word Processor Data to a Database** It's possible to transfer information from a word processor document to a database, but you'll have to adjust parse settings to put the text into database format. These settings determine how Jazz breaks the text into field values and when it starts new records. When Jazz finds a tab character in the text you're pasting, it moves to the next cell in the row and fills it. When Jazz finds a carriage return, it moves down to the first cell in the next row and fills it. You can paste columns of figures from the word processor into the database without changing parse settings if the columns are separated by tabs in the document. If the columns aren't separated by tabs, change the parse settings to the character that separates them.

**HotView of a Database** Any database selection can be included as a HotView in a word processor document. Until you "freeze" the HotView, changes to the selected area in the database will automatically be made in the word processor document. This means you can draft reports and presentations that refer to the database and update them automatically in the finished draft. Chapter 6 has details about using the HotView feature.

**Database and Communications** The communications module is a channel both for sending and receiving data. The basic technique for sending information from a database is to establish contact between Jazz and another computer, select the database or portion of it, and transmit. The technique for receiving data is similar. In each case, you must specify several communications settings, including parse settings for the database. Chapter 7 describes communications techniques.

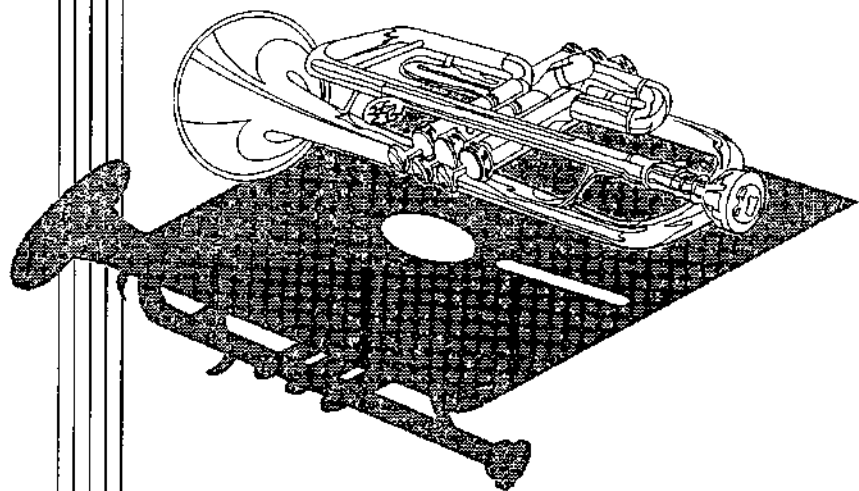
**Database and Other Macintosh Programs** Database material copied to the Clipboard can be pasted into other Macintosh programs. Before copying information from other programs into the database, check the column and row separators used by the programs. If necessary, change the database parse settings to match the settings used by the other program.

**S***ummary* The Jazz database is an efficient way to store and control information. Use it to organize, locate, and review information and as a databank for other Jazz modules. Working with a database involves several steps:

1. Set up the database by defining fields—the categories of information that you'll work with.
2. Build up the database by adding information to records.
3. Design forms for efficient data entry.
4. Edit and modify the database as needed.
5. Find information using database queries.
6. Move information between the database and other Jazz modules.

This sequence of use makes Jazz an information manager. The final element in the cycle brings information out of the database, in the form of database reports, for use in decision making. Database reports are described in the next chapter.





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# ***DATABASE REPORTING***



# 3

**INTRODUCTION** The whole point of Jazz is to make information dynamic—something you can look at, analyze, and work with seamlessly from one Jazz module to another. If a database simply collected and locked up information, it would be a convenient but restricted management tool. As an integrated program, Jazz makes its database module much more than just a storehouse of information. You can get to the database from any part of Jazz—worksheet, word processor, communications, or graphics—and put it to use.

Database reports are printed versions of information in the database. They're another way to make information visible for analysis and decision-making. Reports have various uses. They document the contents of the database, provide statistical summaries, and are ready-made for presentations. You create each report according to your needs.

This chapter shows you how to define a database report, print it, and save the report as a text document that can be edited with the Jazz word processor. We also describe the formulas and statistical functions that can be used with the database.

# **E** **EXECUTIVE REPORT**

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## **REPORTING SAMPLE PAGE**

WIDGECO INC.

Sales Performance Report

### **APPENDIX A PERFORMANCE FIGURES**

#### **④ Central Sales Region**

| <b>③ Last Name</b> | <b>First Name</b> | <b>Sales</b> | <b>Index</b> |
|--------------------|-------------------|--------------|--------------|
| Caffrey            | Paula             | \$366,960    | 100%         |
| Castle             | Robert            | \$550,440    | 102%         |
| Connors            | Elizabeth         | \$394,760    | 104%         |
| Cook <b>⑤</b>      | Patrick           | \$428,120    | 118%         |
| Franklin           | Julius            | \$333,600    | 139%         |
| Henderson          | Janet             | \$536,540    | 98%          |
| Marques            | George            | \$386,420    | 94%          |
| Martin             | Vera              | \$417,000    | 96%          |
| Monaldez           | Frank             | \$558,780    | 80%          |
| Muller             | Elizabeth         | \$450,360    | 110%         |
| Roche              | Joan              | \$397,540    | 109%         |
| Stephens           | Johnathan         | \$514,300    | 101%         |

**② Sales Total for Region Central**      \$5,334,820

**Average Index for Region Central**      104%

## **K** KEY TO THE SAMPLE PAGE

The sample page opposite is part of a database report printed for the WidgeCo sales conference. The report summarizes information in the Sales Staff database used by executives in the Marketing Department.

- Ⓐ The header identifies this page as part of the sales conference material. The header was included in the report definition.
- Ⓑ These summary lines are calculated as part of the database report. The first line shows total sales for the region, and the second line measures the performance average, which is the ratio of actual sales to targeted goals for each salesperson.
- Ⓒ The report is divided into sales regions. The field that divides a report into sections is called the break field. The break field—in our example, region—is part of the report definition.
- Ⓓ Each column in the report is headed by a field name. The fields in this example—Last Name, First Name, Sales, and Index—are part of the report definition.
- Ⓔ Each section of the report lists the records of sales staff for that region.
- Ⓕ The footer identifies the figures in the report. The footer was included in the report definition.

## CREATING THE SAMPLE PAGE

This report summarizes information in a Marketing Department database. The database itself includes eight fields, but only four are needed for the report: Last Name, First Name, Region, and Index. The index value for each record is the ratio of actual sales to sales goal. WidgeCo uses the index value when reviewing individual performance. In this section of the chapter, we see how a WidgeCo manager creates a database report.

**Prepare the Database** The field that divides a report into sections is called the break field. It's the same as the sort field used to prepare the database before defining the report.

Open the database and choose Set Fields from the Sort menu. Specify Region as the first sort field and Last Name as the second. Set ascending sort order for both fields, then sort the database. As shown in Figure 3R.1, in this sort, the records are grouped by region and listed alphabetically within region.

| performance report |           |            |              |         |        |
|--------------------|-----------|------------|--------------|---------|--------|
|                    | Last Name | First Name | SSN          | Region  | Sales  |
| 7                  | Marques   | George     | 343-26-4819  | Central | 464260 |
| 8                  | Martin    | Yera       | 255-31-6051  | Central | 386420 |
| 9                  | Monaldez  | Frank      | 167-30-0865  | Central | 314140 |
| 10                 | Muller    | Elizabeth  | 943-19-5678  | Central | 422560 |
| 11                 | Roche     | Joan       | 735-32-2788  | Central | 464260 |
| 12                 | Stephens  | Jonathan   | 626-90-1944  | Central | 278000 |
| 13                 | Akins     | James      | 582-81-2780  | East    | 408660 |
| 14                 | Coffey    | Eleanor    | 770-46-5329  | East    | 550440 |
| 15                 | Ford      | Franklin   | 563-841-2709 | East    | 272440 |
| 16                 | Gerald    | Anthony    | 443-52-8902  | East    | 530980 |
| 17                 | Harrison  | Benjamin   | 431-69-4035  | East    | 291900 |
| 18                 | Jackson   | Ellen      | 262-60-7731  | East    | 536540 |
| 19                 | Jefferson | Carla      | 663-92-4091  | East    | 355840 |

Figure 3R.1: Sort the database.

**Define the Report** After sorting the database, choose Show Definition from the Report menu. Jazz opens a Report Definition window. We need to specify several features of the report:

- The page header and footer
- The section header
- The record detail line, which defines field values for each record
- The statistical functions which summarize the numbers in each section
- The statistical functions for the entire report
- The break field
- The page size or number of lines per printed page

Figure 3R.2 shows the completed report definition for the sample page. The equal sign (=) before field names in the report detail line

| performance report: sales staff |             |                      |                              |  |
|---------------------------------|-------------|----------------------|------------------------------|--|
| <b>Page Header</b>              |             |                      |                              |  |
| WIDERECD LINE                   |             |                      | 25th Annual Sales Conference |  |
| <b>Section Header</b>           |             |                      |                              |  |
|                                 | =Region     | Sales Region         |                              |  |
| Last Name                       | First Name  | Sales                | Index                        |  |
| <b>Record Detail Line</b>       |             |                      |                              |  |
| =Last Name                      | =First Name | =Sales               | =Index                       |  |
| <b>Section Summary</b>          |             |                      |                              |  |
| Sales Total for Region          |             | =Region              | =FSUM(Sales)                 |  |
| Average Index for Region        |             | =Region              | =FAYG(Index)                 |  |
| <b>Page Footer</b>              |             |                      |                              |  |
| Performance Figures             |             |                      | =FPAGE                       |  |
| <b>Report Summary</b>           |             |                      |                              |  |
| Sales Total                     |             | All Regions          | =FSUM(Sales)                 |  |
| Average Index                   |             | All Regions          | =FAYG(Index)                 |  |
| <b>Break Field:</b> =Region     |             | <b>Page Size:</b> 46 |                              |  |

Figure 3R.2: Completed Report Definition.

means "use actual field values in the report." Jazz also requires an equal sign before functions such as those in the section and report summaries.

**P***review and Print the Report* Before printing the report, we should check the report definition to see how it works. Make the Database window active and choose Select All Records from the Edit menu. Then choose Preview from the Report menu. The report appears in a Preview window as in Figure 3R.3. If the report doesn't look as it should, close the window, choose Show Definition from the Report menu, and correct the report definition.

After one or two corrections to the report definition, we're ready to print the report. Choose Print from the Report menu, set the print quality, and click OK. Having printed the report, the last step is to name the report definition and save it for future use. Choose Names

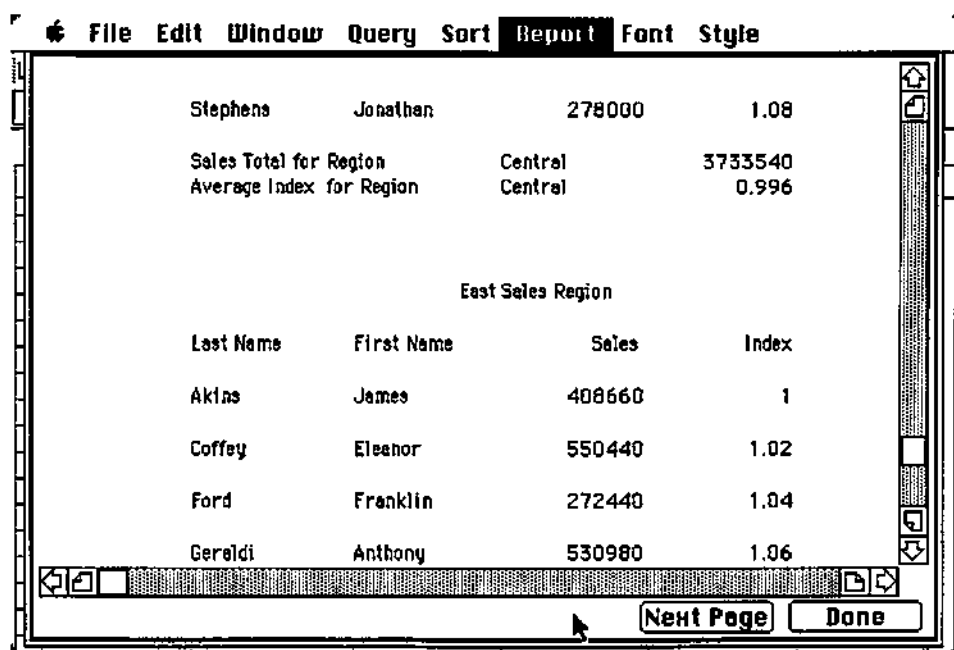


Figure 3R.3: Preview of a Database Report.

from the Report menu, then type a name for the report definition and click Done. We can use the saved report definition to generate updated versions of the report as the database changes.







**P***reparing the Report* There are two phases in creating a database report: preparation and production. Each phase has several steps. First we'll review the preparation phase.

Database report preparation includes the following steps:

- Opening a database
- Sorting records by sections as they'll appear in the report
- Completing a report definition to specify the contents and format of the printed report

**Sorting** A report always pertains to a specific database. The first step in preparing a report is to open or create a database and decide how to organize the report. The report can contain any or all records, specific field values or field combinations, and summary information about the selected records. The basic rule is that if you can select the data, you can create a report for them.

One of the most useful features of Jazz reports is that they can be divided into sections. Suppose, for example, you have a database of customer information and are curious about where the customers are located. You could produce a report listing all the records in the database, but it would be tedious to go through the entire list to find out who was located where. Instead, you can organize the report into sections by location—by city or state, for example. The field that divides a report into sections, called the break field, is the same as the sort field in the database. For the customer report, we would use the City or State field first to sort the database, then to organize the report in sections. The result would be that all the customers in a particular location would be grouped together in the report.

To begin preparing a report, choose the field under which you'll group records together in the report. Then sort the database using this as the first sort field. Figure 3.1 uses city as the first sort field and company name as the second. Both are in ascending order. In the database, this sort will list company names alphabetically by city. The report will be divided into sections by city with the same alphabetical list of company names.

**The Report Definition** Defining a report means specifying details about its format and content. To prepare the first report after you've sorted the database, choose Show Definition from the Report menu. (The technique for creating additional reports uses names rather than Show Definition as described at the end of this section.)

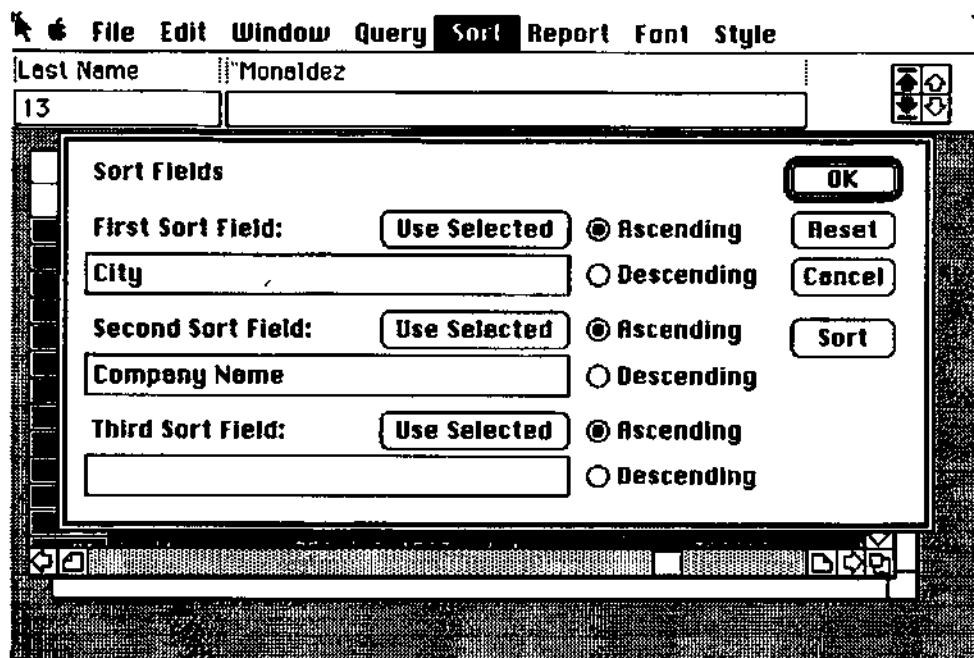


Figure 3.1: Sort records as you want them to appear in the report.

Jazz responds with a Report Definition window, as in Figure 3.2. The title bar shows that this report belongs to the Performance database and that it's the fourth report associated with this database. A report definition always has a name—initially, REPORT 1, REPORT 2, and so on. You can rename the report definition using the Names command on the Report menu.

The report definition has blank cells, much like a Database Worksheet or window. To create a definition, type entries in the cells under Page Header, Section Header, and the other report settings. The entries can be text, field names, formulas, or database functions. Figure 3.2 shows eight report options:

- **Page Header:** Anything typed here will be printed across the top of each page in the report. The report title is a typical page header. To include a page number as part of the header, type `FPAGE` in one of the cells of the Page Header area.
- **Section Header:** Reports can be divided into sections by specifying a break field. Anything that you type as a section header

File Edit Window Query Sort Report Font Style

performance report: Report 4

Page Header  
This is the report definition window

Section Header

Record Detail Line

Section Summary

Page Footer

Report Summary

Break Field: Page Size: 46

|    |          |          |             |         |     |
|----|----------|----------|-------------|---------|-----|
| 11 | Roche    | Joan     | 735-32-2788 | Central | 464 |
| 12 | Stephens | Jonathan | 626-90-1944 | Central | 278 |

Figure 3.2: Report Definition window.

appears at the beginning of each section. Include the break field name, beginning with an equal sign (=), as part of the section header, together with text that identifies each column of field values in the report.

- **Record Detail Line:** Records are printed separately, line by line in the report. The record detail line specifies the fields included for each record. You type field names, preceded by an equal sign, in separate cells on the record detail line. In the report, corresponding field values are printed for each record.
- **Section Summary:** This is an area for formulas that summarize numerical data in the section. Jazz has nine statistical functions specifically for database reports, plus single-argument worksheet functions that can be used in the section summary. Usually, the section summary also includes a text label or description for the numbers that will appear in the report.
- **Page Footer:** Anything typed here will be printed across the bottom of each page in the report. In addition to text,

the footer usually includes a page number. To number report pages in the footer, type FPAGE in one of the cells in this area.

- **Report Summary:** Like the Section Summary area, this is an area for statistical formulas. In this case, the formulas summarize and print results for the entire report. The report summary usually includes a text label or description to be printed with the numbers.
- **Break Field:** This is the field that divides a report into sections. The field name that you type here, preceded by an equal sign, is the first sort field for the database.
- **Page Size:** This specifies the number of lines per printed page. Specify the number of lines according to the type size, margin settings, and paper that you are using for the report.

**Editing the Report Definition** The Report Definition window is a work area like any other in Jazz. You select cells, type and edit entries, and rearrange the definition as needed. The definition affects the report in two ways: the cell entries in the definition determine what appears in the report and the layout of the Report Definition window determines the report's appearance, including the space between sections and identifying text, how field columns are aligned, and where the headers and footers appear on the page.

Formatting rules for the report definition are fairly simple. You can type entries in any cell in the Report Definition window. The cell location determines where the entries appear on the printed page. For example, moving an entry from one cell in the Report Definition window to a cell further right will move the corresponding entry to the right on the printed page. Moving an entry up or down a line in the definition window has the same effect in the printed report. Cells can be edited and changed with by using the standard commands on the Edit menu.

**Report Layout** The different areas of a new Report Definition window are separated from each other by one line. To increase the space between them—and so increase the space between corresponding portions of the report—choose Insert Report Line from the Edit menu. The line will be inserted above the active cell in the Report Definition window. To remove a line, activate any cell in it and choose Delete Report Line from the Edit menu. Be careful

about deleting lines that have cell values because you can't undo the deletion. In Figure 3.3, we've increased the space between the Page Header and Section Header areas to three lines and inserted a line between the Section Summary and Page Footer areas. Entries typed on different lines in the definition will print on different lines in the report.

**Record Detail Area** In the report, field values are printed in columns corresponding to the fields that you specify on the record detail line. Each field name is defined in a separate cell on one line in the Record Detail Line area. Figure 3.4 shows four field names. The equal sign before each name specifies that the field columns in the report will show actual field values for each record.

Field values can be formatted in the report just as they can be formatted in the database. To specify the format of a column of values, click the field name in the Record Detail Line area and choose Field Format from the Edit menu. Select a format from the Format dialog box. The space between entries in the Record Detail Line area

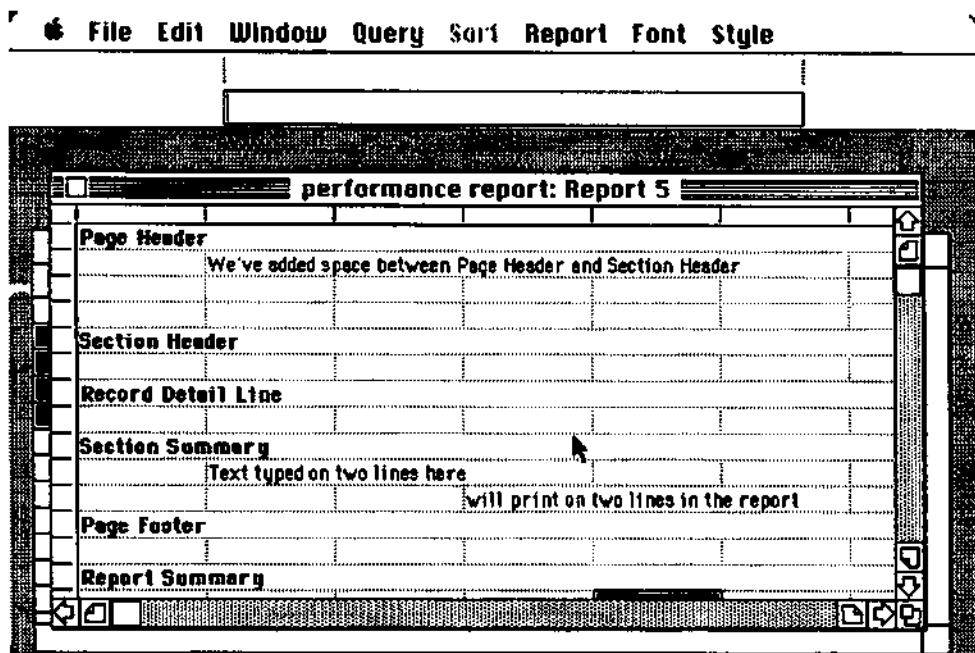


Figure 3.3: Layout of the Report Definition determines appearance of the printed report.

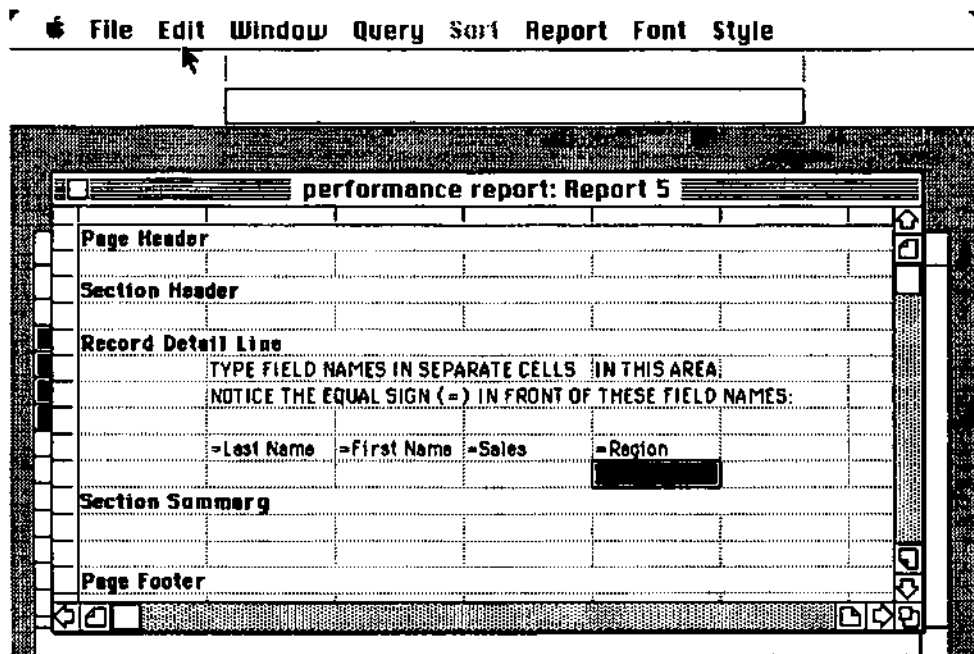


Figure 3.4: Field names in the Record Detail Line print columns in the report.

determines the space between columns on the report. Entries in adjacent cells are always closest in the report.

**Formulas and Functions** Entries in the Record Detail Line area aren't restricted to field names. For a numerical field, you can use any single-argument worksheet function (a function with one variable) to define a formula with the field as argument. Each record of the report will have a field value calculated by the formula. Suppose, for example, you wanted values in a field called Temp to be reported as integers only. The entry for this field on the record detail line would be: =INT(Temp). In the report, the INT function will round each Temp value to the nearest integer.

A further refinement you can make on the record detail line is to write formulas that relate different fields to each other. This is the database idea of calculated fields applied to report definitions. Suppose a database has three fields: Cost, Selling Price, and Revenue. In setting up the database, you can define Revenue as a calculated field using the formula Revenue=(Selling Price-Cost).

Whenever you enter values in the Selling Price and Cost fields, Jazz calculates the Revenue field value automatically. You don't need to enter it separately.

Even if Revenue isn't a calculated field in the database, we can make it one in the report. In the Record Detail Line area, we define a Revenue column with the formula  $\text{=(Selling Price-Cost)}$ . In the Section Header area, we type Revenue as the label for this column. As a result of this definition, Jazz will calculate and print the revenue figure for each record in the report. The rules for formulas are the same in the database, the worksheet, and in report definitions. The only restriction is that functions in the database itself and in the report detail line must be single argument.

**Section and Report Summaries** Use the Section Summary and Report Summary areas in the Report Definition window to specify the statistics that you want to include about the records in the report. When printed, the section summary shows results for the records grouped by break field. The report summary shows results for the entire report. Jazz has nine statistical functions for use in section and report summaries. These are typed as formulas in the summary areas. You can also type labels and descriptions for the numbers that are printed in the report.

Figure 3.5 shows the section summary for the sample report that begins this chapter. The summary includes two lines of descriptive text, Sales Total for Region and Average Index for Region. In the printed report, the text will appear exactly as shown. Region is the break field in this report definition. The entry  $\text{=Region}$  means "print the region name as part of each section summary."

The last two entries in the section summary,  $\text{=FSUM(Sales)}$  and  $\text{=FAVG(Index)}$ , are report functions. The equal sign indicates that the entry is a formula, function, or field, not literal text. The  $\text{=FSUM(Sales)}$  means "add all the values for sales in this section and print the total here." The  $\text{=FAVG(Index)}$  means "average the values for Index in this section and print the result here." The instructions are the same for each section of the report.

FSUM and FAVG are two of the report functions that can be used in summaries. Each function in the following list uses field as the argument (they evaluate records for the specified field):

|                    |                                      |
|--------------------|--------------------------------------|
| FAVG(field name)   | Averages the field values            |
| FCOUNT(field name) | Counts the number of field values    |
| FMAX(field name)   | Shows the maximum value in the field |

|                  |   |
|------------------|---|
| FMIN(field name) | Shows the minimum value in the field              |
| FSTD(field name) | Calculates the standard deviation of field values |
| FSUM(field name) | Totals the field values                           |
| FVAR(field name) | Calculates the variance of field values           |

All of these functions have a standard format. To use any of them in a section or report summary, first click a cell, then type an equal sign, the function, and the field name. Enclose the field name in parentheses. So, for example, to evaluate the standard deviation of a set of test scores, type =STD(Scores).

The functions FPAGE and FPREV differ slightly from the preceding functions. FPAGE numbers the pages of the report consecutively. It's typed in the Page Header or Page Footer area of the report definition, not in the Summary Section area. To specify page numbering, click a cell in the Page Header or Page Footer line and type =FPAGE.

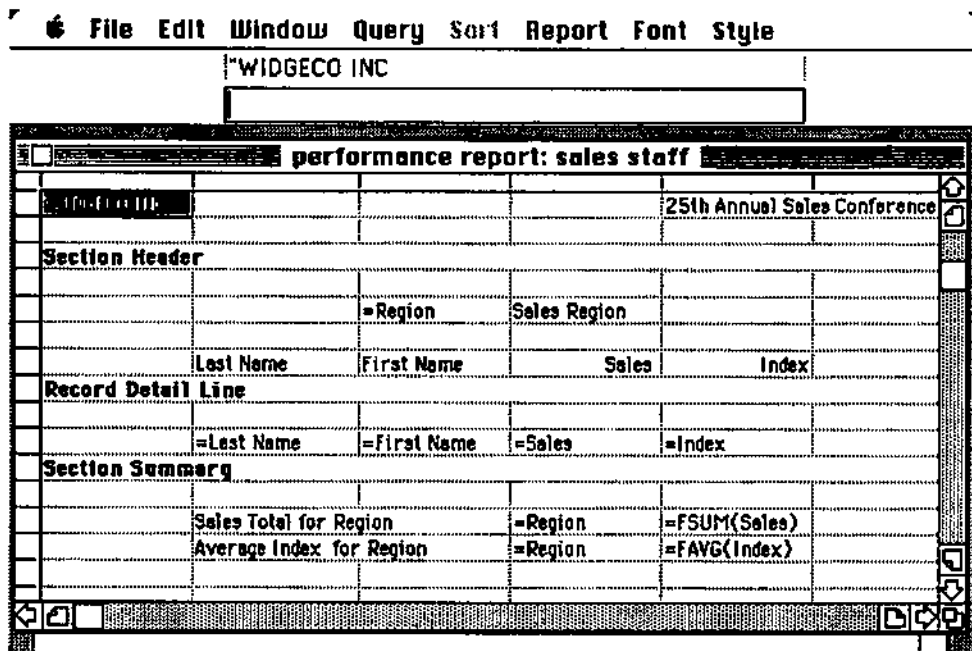


Figure 3.5: The section summary specifies statistics for two numerical fields: Sales and Index.



Used in a record detail line or section summary, FPREV keeps a running total of field values by record or by section. The format is =FPREV+Field Name. For example, the entry =FPREV+Sales in the Report Detail Line area will print cumulative sales values for each record in the report.

A report summary is similar to a section summary, except that it shows statistics for the entire report. The functions and formats used in the report summary are the same as those in the section summary. Figure 3.6 shows the report summary for the sample report that begins this chapter. Sales Total and Average Index are descriptive labels that will be printed as they appear in the Report Definition window. In the Section Summary area, the entry =Region specifies that the printed report will have region names in this place. In the Report Summary area we use a text label, All Regions, instead. The label, which identifies the cumulative report statistics defined by =FSUM(Sales) and =FAYG(Index), will be printed as typed.

**Break Field** The break field (the sort field used to prepare the database) organizes the report into sections. If you wish to print a

File Edit Window Query Sort Report Font Style

WIDGECO INC

performance report: sales staff

| =Last Name               | =First Name | =Sales      | =Index       |
|--------------------------|-------------|-------------|--------------|
| <b>Section Summary</b>   |             |             |              |
| Sales Total for Region   |             | =Region     | =FSUM(Sales) |
| Average Index for Region |             | =Region     | =FAYG(Index) |
| <b>Page Footer</b>       |             |             |              |
| Performance Figures      |             |             | =FPAGE       |
| <b>Report Summary</b>    |             |             |              |
| Sales Total              |             | All Regions | =FSUM(Sales) |
| Average Index            |             | All Regions | =FAYG(Index) |
| Break Field: =Region     | Page Size:  | 46          |              |

Figure 3.6: Report Summary.



delete lines. To narrow or widen a cell, drag the vertical margin lines above the Page Header area.

- An equal sign before a field name or formula means that Jazz should use actual field values at this place in the report.
- Precede field names with an equal sign in the Record Detail Line area. Type each field name in a separate cell.
- Always begin formulas with an equal sign.
- Precede the break field with an equal sign in the Section Header, Section Summary, and Break Field areas. This will print the correct break field value after each section of the report.

**Naming and Saving Report Definitions** It's often the case that you'll want updated reports as a database changes. It's also possible that you'll need several reports to analyze the database in different ways. Jazz meets both these needs. You can save any report definition and use it whenever you wish. You can also create different report definitions for the same database.

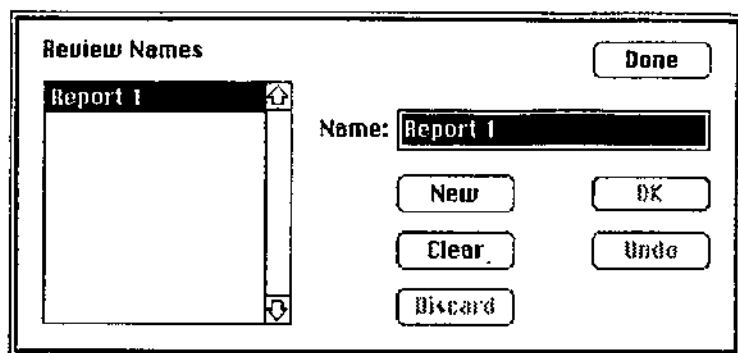
When you create a report definition, Jazz automatically assigns it a name. The first report definition is Report 1; the second is Report 2, and so on. You can rename these report definitions, create new ones, or discard a report definition by using the Names command on the Report menu.

Suppose, for example, we've created a report definition for a database and want to rename it. Since this is the first report definition, Jazz assigns it the name Report 1. To change the name, we choose Names from the Report menu. Jazz responds with a Review Names dialog box, as shown in Figure 3.8.

Figure 3.8 shows that the open database has only one report definition, Report 1. The highlighting bar means that this is the active report definition—the one shown when you choose Show Definitions from the Report menu. We can rename any report definition by selecting it, typing the new name, and clicking OK. Report 1 isn't a very descriptive name. We might rename it Inventory.

Figure 3.8 also shows other options for report definitions:

- **Undo** restores the previous name for the active report definition.
- **Clear** erases the contents of the active report definition so that you can rewrite the definition using the same report name.



**Figure 3.8:** Names of report definitions are shown in a dialog box like this.

- **Discard** erases both the contents and the name of the active report definition. (Before discarding a report definition, be sure you don't need it.)
- **Done** closes the dialog box and displays the open database.

Saving a report definition takes no effort. When you save a database, all its report definitions are saved with it.

**Creating and Choosing Report Definitions** Jazz automatically creates a blank report definition for each database. When a database has only one report definition, this definition is always active. You can see it by choosing Show Definition from the Report menu, as we did at the beginning of this chapter. To create and activate additional report definitions, you use the Review Names dialog box.

Figure 3.9 lists five report definitions, three of which—Report 5, Report 7, and Report 8—are new and have names assigned by Jazz. We created each of these report definitions by first clicking New in the Previous Names dialogue box and then by completing the definition in the Report Definition window. These are the steps for creating additional report definitions after opening a database:

1. Choose Names from the Report menu.
2. Click New in the Review Names dialog box.
3. Type a name for the new report definition.
4. Click Done to display the Database window.

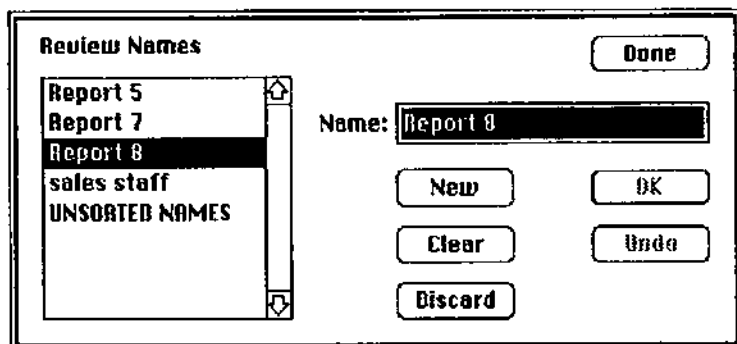


Figure 3.9: Use New to create new report definitions.

5. Choose Show Definition from the Report menu.
6. Complete the report definition in the Report Definition window.

Choosing Show Definition from the Report menu displays the active report definition. In the sequence above, the newly created report definition is active. Choosing Show Definition displays its blank Report Definition window. To make any report definition active:

1. Choose Names from the Report menu.
2. Select the report name from the Review Names dialog box.
3. Click Done to display the Database window.
4. Choose Show Definition from the Report menu.

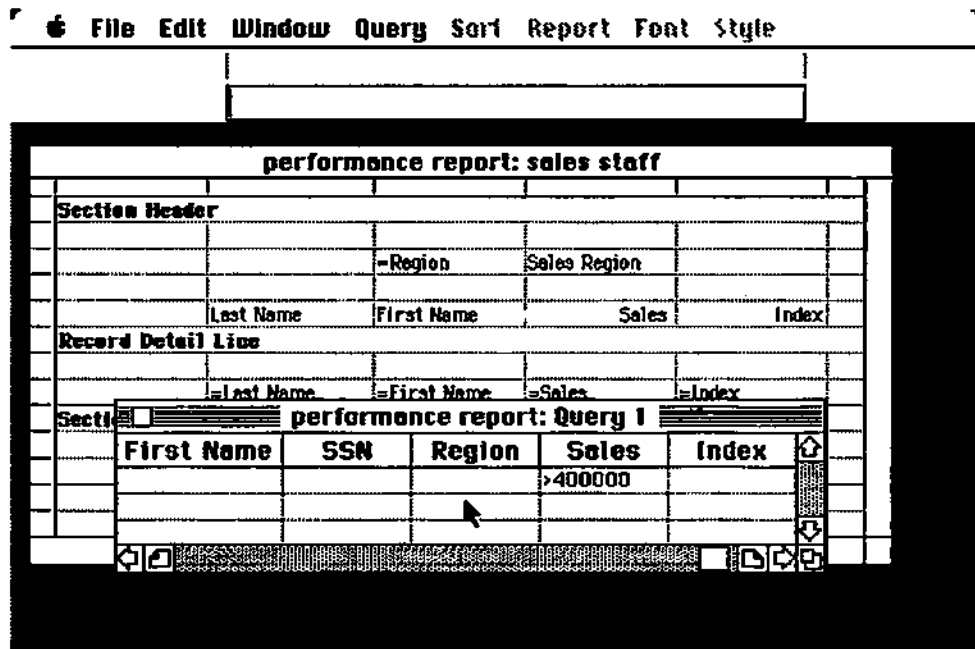
**P**roducing a Database Report After completing a new report definition or selecting an existing one, production takes only a few steps:

1. Select records for the report.
2. Preview the report on the screen and edit the definition as needed.
3. Print the report and save the report definition or produce the report on disk as a text document for use in other Jazz modules or Macintosh programs.

**Selecting Records for the Report** Like the database itself, reports are organized by fields and records. The record detail line in the report definition specifies fields. You specify records by selecting them in the database. If the report that you're producing includes a break field, it's a good idea at this point to check that the database has been sorted correctly. Be sure that the first sort field and the break field are the same.

Use standard techniques to select records individually or in sets: drag across the record numbers or option-click them. To select all records in the database, choose Select All Records from the Edit menu. One way to increase the analytical value of database reports is to use database queries when selecting records. Queries isolate very specific sets of data. Reports print them out for review.

The sample report at the beginning of this chapter lists salespeople by region. Suppose we wanted to list only those people whose sales were greater than \$400,000. First, we set up the query definition, as shown in Figure 3.10, then we select the records that meet the criteria, as shown in Figure 3.11.



**Figure 3.10: Query definition for sales greater than \$400,000.**

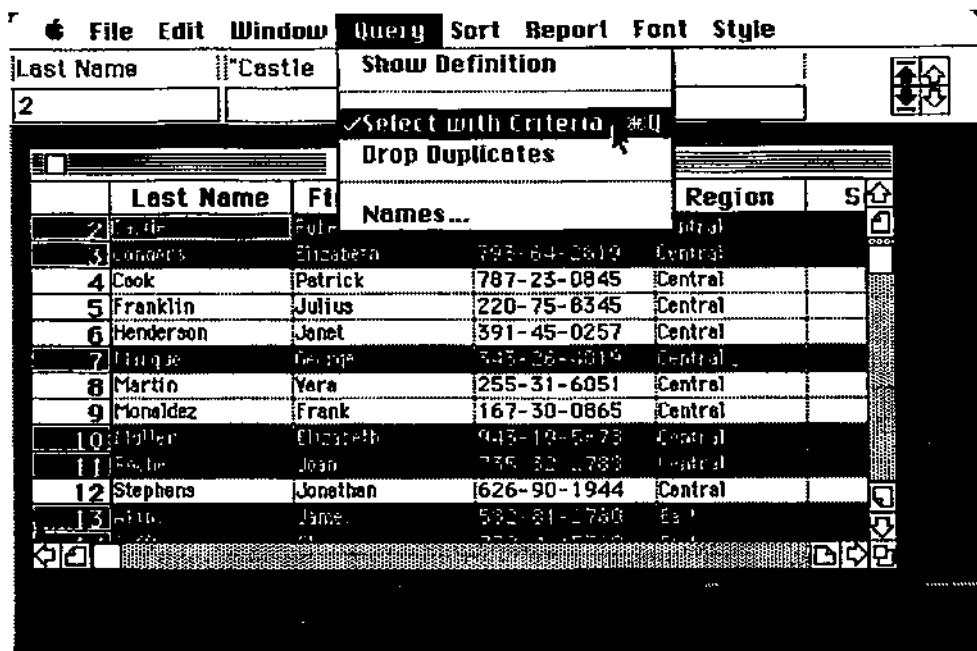


Figure 3.11: Records that meet the query criteria.

**Screen Previews** Once we have sorted the database and selected records, we could print the report. But it's a waste of time and paper to find out from the printed copy that the report doesn't look as intended. It's far more convenient to check the report on the screen and, if necessary, edit the report definition before you print it.

Choosing Preview from the Report menu displays a screen version of the printed report. Figure 3.12 previews part of the report defined with the query criteria in Figure 3.10. The screen lists people in the central region whose sales were greater than \$400,000. The section header (Central Sales Region), the field columns (Last Name, First Name, Sales, and Index), and the section summary (Sales Total for Region and Average Index for Region) are all part of the report definition.

Use the scroll bars in the Preview window to see other parts of the report. If the report doesn't look correct, click Done; then choose Show Definition from the Report menu. Edit the report definition, then preview the report again. Repeat this procedure until you're satisfied with the result.

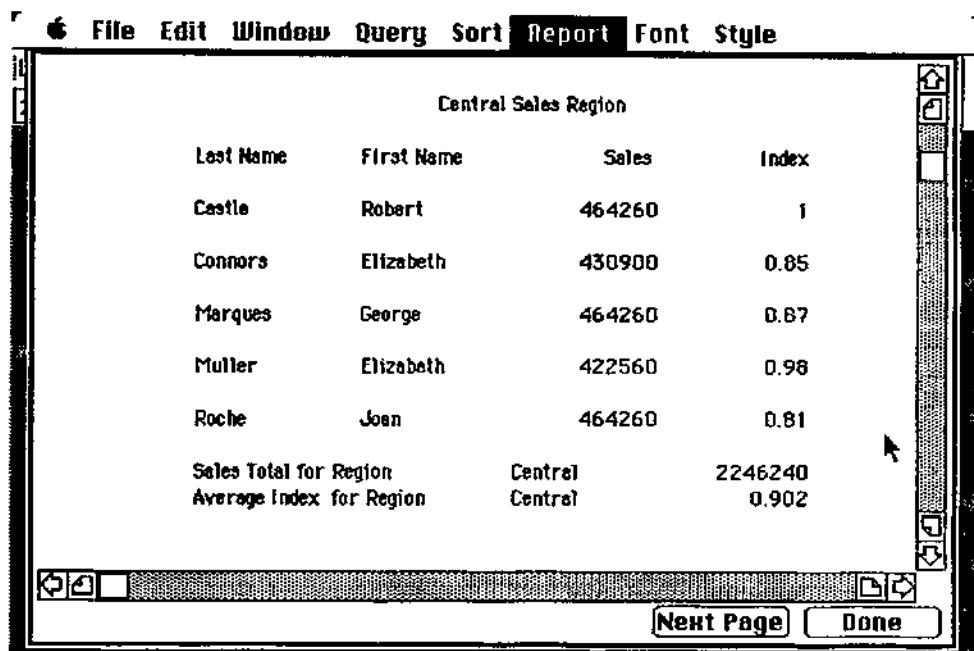


Figure 3.12: Screen preview of a printed report

The screen preview in Figure 3.13 shows two common formatting problems: misaligned columns and truncated numbers. You can align columns by repositioning entries in the Report Definition window. You may also want to specify alignment formats (left, right, or centered) for field values. The cure for truncated numbers is to widen the corresponding cell in the report definition. You can widen and narrow cells by dragging the margin lines at the top of the cell in the Report Definition Window.

**Printing** When you're satisfied with the screen preview, the last step before printing is to set up the page format. Choose Page Setup from the File menu and specify the paper type and margins. If you included headers and footers in the report definition, don't repeat them in the Page Setup box shown in Figure 3.14.

The paper size and margin settings may affect your printed results in ways that you aren't able to see on the preview screen. The margins that you set, for example, may not allow enough space for all the field columns in the report. If the report doesn't print correctly, change the page setup as needed.



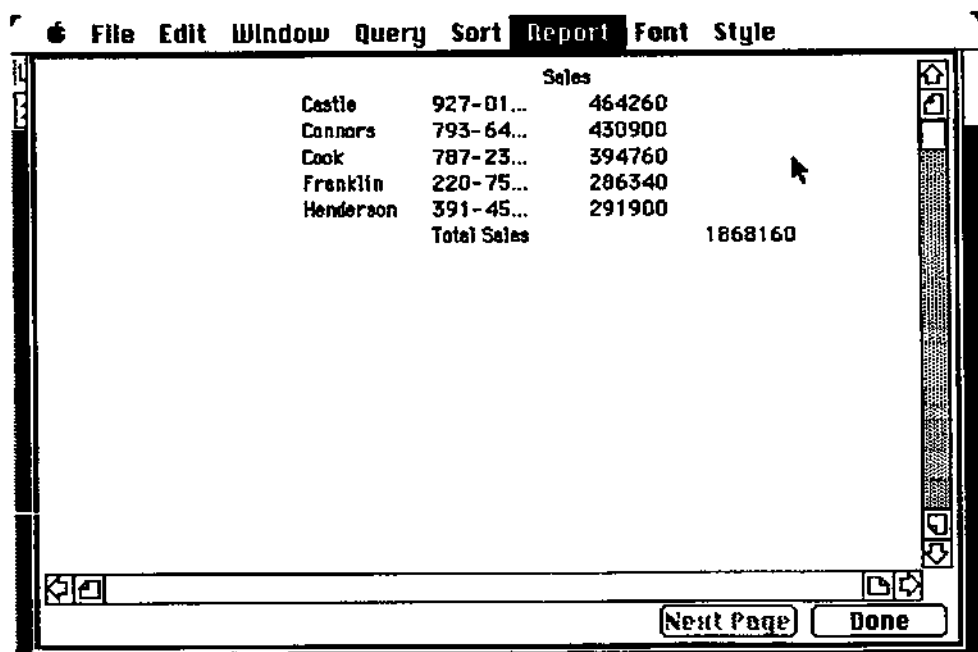


Figure 3.13: This screen preview shows formatting problems.

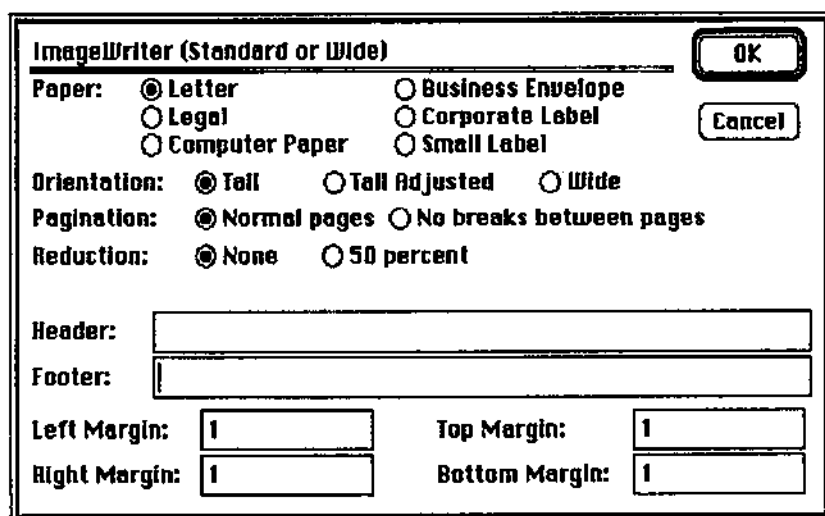


Figure 3.14: Specify page setup before printing.

After setting up the page, choose Print from the Report menu. Then choose the printer settings from the Print dialog box and click OK. You'll get the report specified by the active report definition, for the records selected.

**D**atabase Reports and Other Jazz Modules In addition to printed copies of database reports, Jazz can produce them on disk. You use the Generate Document command on the Report menu to produce reports on disk as Jazz word processor documents. You can edit these reports as you can any other word processor documents and copy them into other Jazz modules and Macintosh programs. All the word processor font and style options, for example, are available for enhancing the report. As always with Jazz, none of your work is kept isolated. Important information in a database report can be used where it's needed—in the worksheet or word processor, for graphics or communications.

**S**ummary Database reports are tools for analysis and decision-making. They display and summarize information in the database and are ideal for presentations. You can define different reports for a database and print updated versions of any report as needed. Producing a report as a word processor document on disk makes it available for use in other Jazz modules.

Database reports are created in two stages. In the first stage, report definition, you specify the contents of the report. In the second stage, report production, you select the records for the report and print it or produce it on disk.

# EXECUTIVE REPORT

## GRAPHICS SAMPLE PAGE

WIDGECO INC.

Sales Performance Report

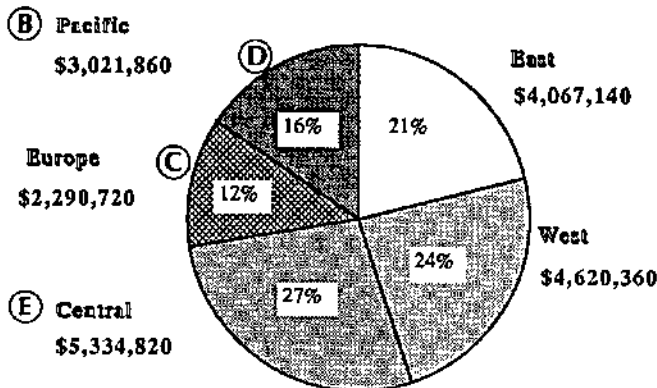
Corporate      \$19,334,900      103%

Average sales figures per salesperson by region were:

|         |           |
|---------|-----------|
| East    | \$338,928 |
| West    | \$355,412 |
| Central | \$444,568 |
| Europe  | \$381,787 |
| Pacific | \$431,694 |

Corporate      \$390,478

(A) The following chart shows the contribution of each region to the corporate sales total:



Regional Sales, 1st Half 1985

This year's performance met or exceeded goals in all Sales Regions. Performance ratios ranged from 100% in the Eastern Region to 106% in Europe. These results represent both an actual increase in sales and improved ratios relative to last year.

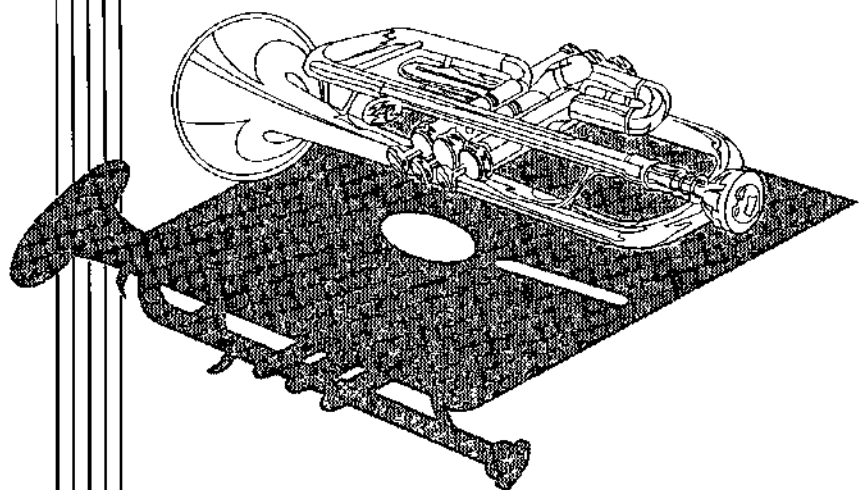
# 5

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**INTRODUCTION** Jazz graphics illustrate the results of your worksheet and database analyses. You can produce a wide range of graphic types, including pie charts and exploded pie wedges, three kinds of bar charts, area graphs, and stock market-style graphs. You can often put several kinds of graphs on the same display to contrast findings.

You can choose among Jazz's many type fonts and styles for labeling graphics, and you have full control over all the elements of your graphs and charts. Graphics adjust instantly to reflect changes in the data that they are based on, even if the related graph is stored on disk. Your graphics can be included in word processor documents and displayed on screen, or they can be printed on the Imagewriter or a laser printer for professional-looking results.

For our WidgeCo executive report, selected areas of a worksheet are highlighted and displayed as graphs. The graphs are labeled and inserted as HotViews in the word processing file containing the report. As numbers are manipulated on the worksheet, the graphs in the word processing file are updated automatically. The final report contains a labeled pie chart showing sales by WidgeCo sales regions.



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# **GRAPHICS**

the analytical basis for reports, databases, and telecommunicated information.

The Jazz worksheet is most closely associated with the Jazz graphics module because it so commonly provides the basic material for graphic display. The next chapter shows how to make full use of the Macintosh's graphic quality and Jazz's integrated modules.

The HotView is linked to the original range. Any change in the original range, including changing the font and type style and hiding or showing the grid, is reflected immediately in the HotView. The HotView is unaffected by tab settings in the word processor document.

You can turn the HotView link off by "freezing" the HotView. Select the HotView to be frozen by clicking the cursor anywhere within the HotView. Go to the HotView menu, and choose Freeze to freeze the selection or Freeze All to freeze all the HotViews in the document. A frozen HotView is no longer tied to the original worksheet from which it came. However, it is still not a regular copy-and-paste item and cannot be edited or altered even though frozen. However, the area can be resized. The small black box that appears in the lower right corner when you click the frozen HotView is a sizing box. When the size of the HotView is changed, the size of the characters within the HotView change proportionally. If you change the HotView box size before freezing it, the characters won't resize until you freeze the box. Unfortunately, the resizing algorithm is somewhat crude, so the larger or small characters don't always look very good. It's better to change the font and style of the original worksheet before freezing that font and style in the HotView.

**Working with Other Macintosh Programs** Although Jazz includes most of the functions you'll need from your computer most of the time, you may still want to move material between Jazz and another program. As with all Macintosh programs, material copied to the Clipboard can be used by other programs. Worksheet ranges in the Clipboard use conventional tabs to separate columns and carriage returns to start new rows. Therefore, worksheet ranges could be copied into MacWrite, for example, following the same rules described above for the Jazz word processing module. Note, however, that some programs use their own special data types and may not be able to recognize Jazz files, and Jazz may not be able to read their files. Jazz does offer a routine for reading files stored in the format used by Lotus Symphony, Lotus 1-2-3, and Microsoft Multiplan's SYLK format standard.

**Summary** The Jazz worksheet offers ease of use combined with enough calculating power to meet the business needs of most users. It also combines with the other Jazz modules to form

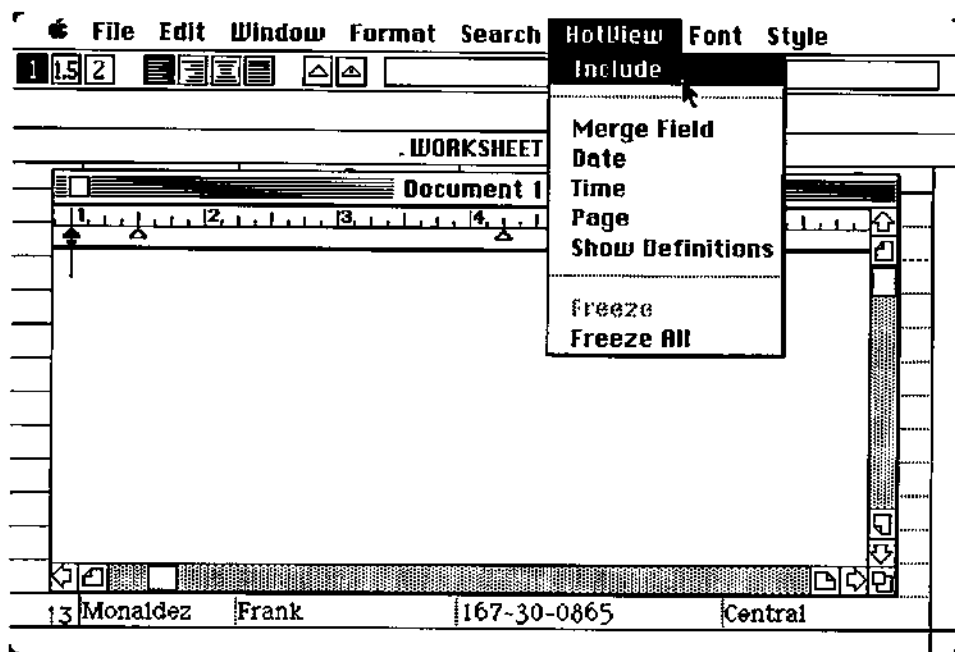


Figure 4.54: A copy of the HotView menu.

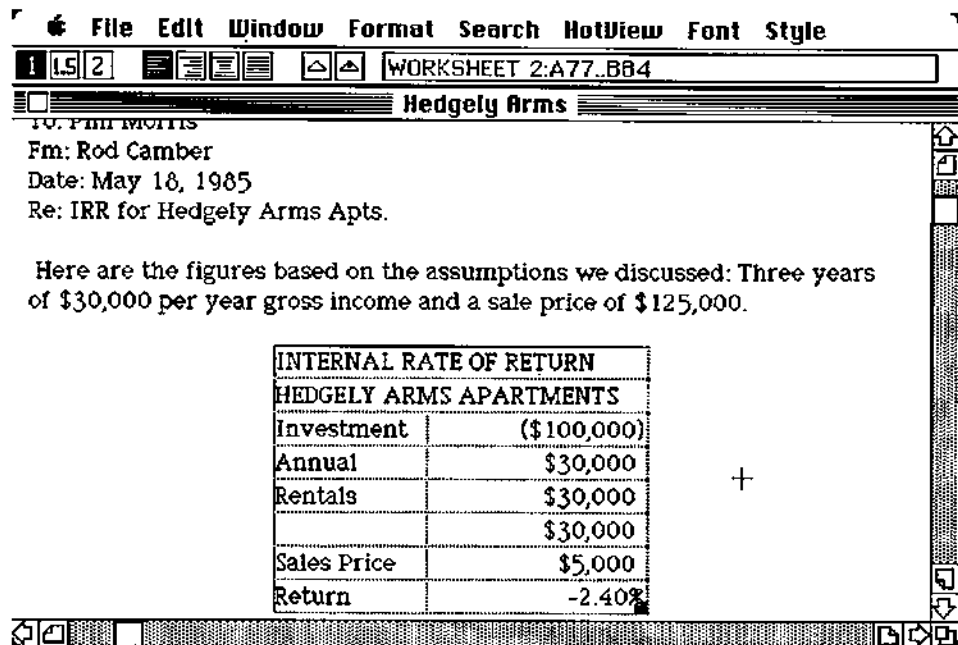


Figure 4.55: A word processor document with a HotView of a worksheet range.



You can change this setup using the Parse Settings command on the Edit menu of the worksheet. This command lets you define the characters that Jazz will use to mark the beginning of a new column and the beginning of a new row. For example, to convert that paragraph of text into individual cells, you could change the column separator definition from a tab to a space; then each word would be in its own cell. This feature becomes useful when dealing with documents received by the communications module or from other Macintosh programs.

**HotView of a Worksheet** There's another way of transferring information from the worksheet to the word processor. It's called HotView, and it puts a temporary copy of the worksheet range into the word processor. Any time you update information in the original range on the worksheet, the copy pasted into the word processor document is updated at the same time. This lets you construct a memo or report while the final figures are still being checked in the worksheet, and your final memo or report will automatically have the latest figures from the worksheet. It also lets you maintain a library of boilerplate reports, such as monthly status reports, where the form and language remain the same and only the date and data change.

To transfer a HotView of a worksheet range, cut or copy the range from the worksheet as usual, then switch to the Word Processing window. Move the cursor to the position in the text where the new material should appear. Now, instead of selecting from the Edit menu, pull down the HotView menu that appears on the Word Processing window's menu bar, shown in Figure 4.54.

Select Include from the HotView menu. The material is pasted into the word processor document centered between the margins. Grids, if showing on the worksheet, also show in the pasted HotView. A box surrounds the material, as shown in Figure 4.55, and the cursor within the area of the HotView is in the form of a large plus sign.

When the cursor is touching the sides of the box, you can drag the box back and forth to reposition it within a narrow range. You can't write in the area of the box or to either side of it, or otherwise edit or change fonts within the HotView area. You can select the entire HotView and cut, copy, and paste it elsewhere, or you can delete it by using the Clear command on the Edit menu. Click the cursor above or below the area of the box to return to writing or editing the rest of the document.

The contents of each cell that is transferred to the word processor are fully spelled out, even if the cell had spillover text. Numbers that have been converted to Scientific format to fit in a worksheet cell will be displayed in full in the word processor document in the format selected for the original cell. Because Jazz copies the entire cell and then tabs to the next tab setting to begin the next entry, entries of different widths in the cells may affect how the worksheet excerpt is displayed in the document, so you'll have to take this into account when setting the tabs and margins in your word processor document.

If you want the worksheet excerpt indented within the word processor document, simply insert a ruler just before the worksheet copy and move the left margin. The worksheet data will move into the new margin.

If you accidentally copy an entire column, down to row 8192, when you intended to copy only a portion of it, the result will be lots of blank space and page breaks in the word processor document. You can erase the mistake with the Clear command. Don't use Cut or Copy because you might overload the Clipboard.

Once pasted down, the data can be treated as regular word processor text. You can divide it up, and portions can be highlighted, moved, and edited. You can also change fonts and alter type styles. This is one way to produce a worksheet printout with portions emphasized and selected items underlined—options that are available for word processed documents but not for individual cells in worksheets.

**Cut, Copy, and Paste—to the Worksheet** Transferring information from a word processor document to the worksheet is done in the same way, except that tabs and margins aren't a consideration because the worksheet considers each cell a tab setting. Normally, Jazz starts a new cell in the next column when it encounters a tab character, and it drops down to the beginning cell of a new row when it encounters a carriage return character in the material being pasted. This means you can send to the worksheet any columns of figures where the columns are separated by tabs. It also means that a paragraph of words in the word processor will end up in a single cell in the worksheet (because the automatic carriage returns at the end of lines within a single paragraph aren't treated as "real" carriage returns by the worksheet).

that you've selected will be pasted; any leftover data are lost. Unlike the worksheet, you've must select all the cells receiving information, not just the top leftmost cell of the receiving range.

Arriving data will overwrite existing data in the selected area of the database, just as with the worksheet, except that protected cells or cells whose values are calculated from a formula cannot be overwritten. If you try to transfer data to these types of cells, your Paste command will be canceled and you will get a warning message.

**Working with the Word Processor** You can transfer information from the worksheet to a word processor document and back using the Copy and Paste commands. The HotView feature in the word processor lets you paste an active copy of the worksheet range that will change whenever you change the worksheet. The worksheet can also be used to provide names and addresses for form letters and mailing labels.

**Cut, Copy, and Paste—to the Word Processor** To transfer information from the worksheet to the word processor, begin in the usual manner by highlighting the area to be transferred, then use Cut or Copy to copy it into the Clipboard. Next, switch to the Word Processing window and position the cursor at the point in the document where the copy should start. Choose Paste from the Edit menu to begin the transfer. The worksheet excerpt will appear in the document beginning at the cursor position. The excerpt will push aside, rather than writing over, any text that may be in the way. Grids and borders are not pasted.

Tab settings and margin settings in the word processor document are very important. Because Jazz copies the first cell, then tabs over to the next tab stop to print the second cell, you must remember to set enough tab stops in the word processor document to account for the number and width of the columns that you're importing from the worksheet. It's easy to insert extra tabs and move them around until the copy appears at its best advantage in the word processor document. If you find cells seem to have disappeared, or if they are scattered all over the document with multiple line spaces between entries, don't worry. This apparent disaster can be fixed merely by inserting and rearranging tab stops. You may also find that one data entry isn't lined up properly with the corresponding entries above and below; again, check the tab settings for extra tabs.

Transferring information between modules is as simple as highlighting the desired area, cutting or copying it to the Clipboard, changing the active window, and then pasting the information from the Clipboard into the other module file. Certain modules require special considerations, however, which are discussed below.

**Working with Graphics** The graphics module has an especially intimate relationship with the worksheet module. Details on how the graphics module uses data from the worksheet are given in Chapter 5.

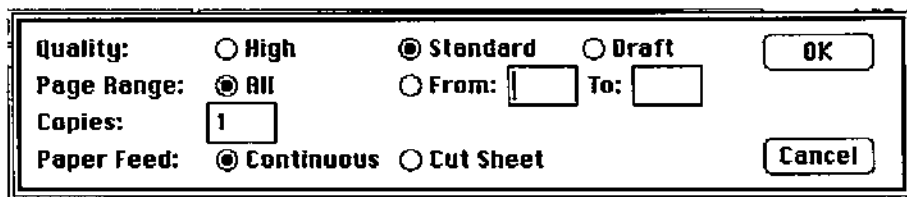
Note that the graphics module receives data from the worksheet and can send it to the word processor or communications module, but not back to the worksheet.

**Working with the Database** To transfer information from a database to the worksheet, simply highlight the area of the database in the Database window and copy it, then switch to the Worksheet window. Click a cell and select Paste. The data will be transferred, with the highlighted cell inserted at the top left corner of the pasted range. The names of the fields are also pasted.

Several cautions:

- The arriving data can overwrite existing material, so make sure that the area that you're using is clear of needed data.
- If you select a range of cells in the worksheet rather than a single cell, only as much data as will fill the range is pasted. Any leftover information is lost.
- If you highlight an entire field in the database (by clicking the field name), you can only cut or copy one field at a time. If you try to copy two fields at a time, a warning message will appear. To bypass this limitation, you can choose Select All Records from the Edit menu or highlight all the records in several ranges.

Transferring data from the worksheet to the database requires a little more care. Whereas the worksheet has many cells available for data transfer, the database has a limited number of cells. Once you've copied or cut some data from worksheet, you must ensure that the database has enough cells to hold all the data that you're transferring. Only as much data as will fit in the cells



**Figure 4.53:** The Print box is displayed when you choose Print Selection or Print Document from the File menu.

not printed when you select Draft mode quality, and only the boldface and underline print styles are available.

**Setting Up Printed Pages** Selecting Page Setup from the File menu will bring up a dialog box with information on printer page dimensions. Among other things, it allows you to print a 50 percent reduced copy of the document, insert a header (printed at the top of every page except the first one), or insert a footer.

The worksheet normally prints with only 1/4-inch left and right margins. The Page Setup box offers you a chance to establish your own margins for worksheets. The margin options are in inches.

If the worksheet is too wide to fit on one page, Jazz will divide it into page-sized segments. Jazz prints the left side of the worksheet first (for example, columns A through F, depending on the width of your columns), for as many pages as are required, then returns to the top of the worksheet and prints the next group of columns (say, columns G through K) from top to bottom, and so on until the entire worksheet is printed. The pages top to bottom are numbered 1, 2, 3, and so on; the pages across are numbered 1.1, 1.2, 1.3, and so on.

If you set page breaks—either column breaks or row breaks—Jazz will obey them while printing, regardless of print mode, and will adjust page-numbering accordingly.

**Working with Other Jazz Modules** The worksheet manipulates numbers. These numbers are often acquired from another module, such as the database or a communications session, and the finished product is often sent to another module, such as a word processor document, a graphics file, or a communications session.

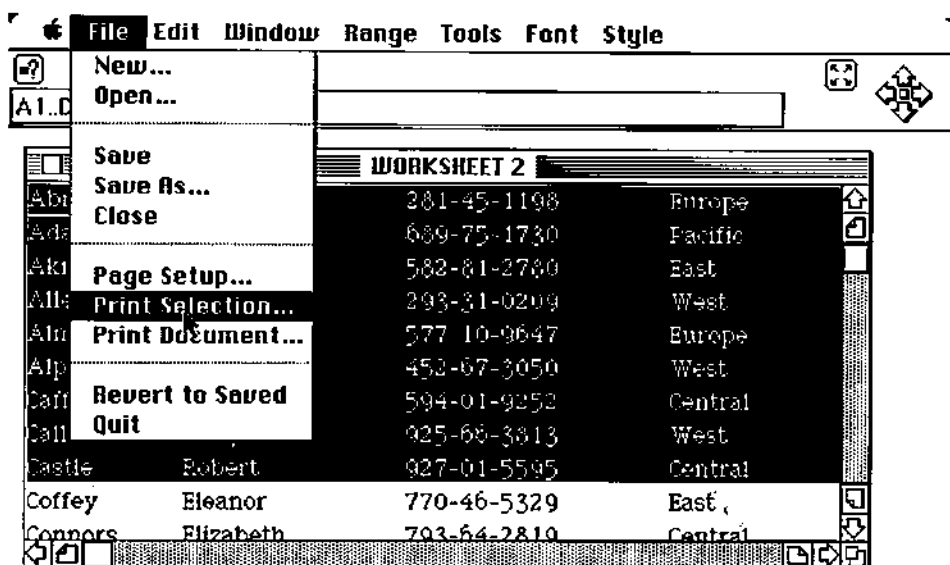


Figure 4.52: The Worksheet Print menu.

**Printing All or Part of a Worksheet** You can quickly print just a section of the worksheet by highlighting the area to be printed, then choosing the Print Selection command from the File menu. Only the highlighted area, plus relevant column and row labels, will be printed. Page break commands will be obeyed. You can print the entire worksheet (or selected pages) by choosing the Print Document command from the File menu. When you choose either Print Selection or Print Document, Jazz responds with a Print dialog box. Its exact contents will depend on what kind of printer you have, but the box will be similar to the one shown in Figure 4.53, which is for the Apple Imagewriter.

**Print Quality** Choose the High option from the Print box to get the best, but slowest, print quality. Standard quality is faster. Draft quality, in order to print quickly, ignores special fonts, graphics, and proportional spacing; as a result, some elements such as column headings may be slightly out of alignment. Worksheet grid lines are

leftmost *n* characters from *cell*. If *n* is greater than the number of characters in the cell, the entire cell contents are returned.

These two functions can be used together with FIND to extract first names or last names from cells containing both. FIND would locate the blank space dividing the two words, RIGHT would extract the second name, and LEFT would extract the first name. For example, if cell R77 contained *John Smith*, then the formula =RIGHT(R77,FIND(" ",0)) would return *Smith*.

SUBSTR (substring) is equivalent to the MID function offered in other programs. It returns *n* characters from the text in the middle of the cell, beginning at position *offset*. If *offset* is 3, it counts over and begins at the fourth character from the left, copying *n* characters.

**REPLACE(*cell,position,delete n,"new text"*)—Replace Text** This function returns a copy of the text in *cell* after substituting new text for selected old text. It goes to a certain position in the text copied from the cell, deletes *n* characters, and inserts new text in its place. The deletion makes room for the insertion, so you can't insert more characters than you delete. As always, *position* begins counting characters with the first character in the cell as position zero. If *delete n* is zero, nothing is deleted. If *n* is larger than the number of characters remaining in the cell, an ERR is returned. Remember to enclose any text references in the function in quotation marks.

**Printing the Worksheet** As with other Jazz files, worksheets can be printed in either of two ways: as a quick print of a highlighted area or as a normal printout of all or selected pages from the document. The File menu, shown in Figure 4.52, includes the Print commands.

When you print a worksheet, you must make decisions about whether to include borders and grids, how much of the worksheet to print, and what print quality you need. You can also select different ways to set up the printed pages.

**Borders and Grids** Your printout will look just like the screen, with grid lines and border labels, unless you turn off either or both by using the Hide Grid and Hide Borders commands on the Style menu before printing. It's common to remove borders and grids before sending a worksheet segment to a word processor document.

**LENGTH(cell)—Number of Characters in Cell** This function counts the number of text characters in the cell. Blank spaces are counted. This can be useful for obtaining information about the cell for use with other text functions.

**TRIM(cell)—Remove Leading and Trailing Spaces** The TRIM function returns a copy of the text in the cell after deleting any spaces preceding the first character and any spaces following the last character. This is useful for preparing labels of addresses or for dividing words in a cell and eliminating any connecting spaces.

**CLEAN(cell)—Remove Control Codes** Macintosh uses special characters called control codes to keep track of special word processing functions. This command "cleans up" the text by deleting all control codes, defined as codes between 0 and 31 on the Macintosh Character Code List (which appears as an appendix in the *Jazz Handbook*).

**CODE(character), CHAR(number)—Character Code Conversion** CODE gives the Macintosh character code equivalent for the character; if a cell is used, it returns the code for the first character in the cell. CHAR returns the character equivalent for the number, which must be between 0 and 255.

**REPEAT(cell,n times)—Repeat Text** REPEAT repeats the contents of the cell the number of times indicated. For example, if cell A44 contains -- then REPEAT(A44,10) returns  
-----.

**FIND("text",cell,offset)—Find Text** This function returns the location in cell where the text begins, after offsetting a given amount. For example, if FIND("the",D19,3) is used and D19 contains *the theory of sets*, the function will skip to the fourth character—the space between *the* and *theory* (because it starts counting with zero)—and looks for *the*, which it finds as part of the word *theory*. The function returns 4, the location of the beginning of the text, as the answer.

The cell containing the text can be used in place of "text", and text can be used in place of cell. An offset of zero causes the function to begin searching at the first character.

**RIGHT(cell,n), LEFT(cell,n), SUBSTR(cell,offset,n)—Extract Text** RIGHT returns the rightmost *n* characters from cell. LEFT returns the



serial value for the time. For example, with 0.336111 for 8:03:59 AM, HOUR(.336111) will return 8 for the eighth hour of the day (8 PM would return 20, using the 24-hour clock method of counting hours); MINUTE(0.336111) will return 3; and SECOND(0.336111) will return 59.

If you get an ERR or a question mark in the cell, check the cell format. It should be numeric or text, not date or time.

The value for these functions can be located in a cell reference or cell name.

**Text Functions** Jazz's text functions enable you to manipulate text by counting, comparing, selecting, and replacing characters in cells.

Because the text being manipulated is usually in a cell, we give the function arguments as cell references in the descriptions below. However, actual text, enclosed in quotation marks, can be substituted. Numbers cannot be used; referring to a number cell with these functions returns an ERR. Only a single cell, not a range or series of cells, can be entered unless otherwise noted.

**UPPER(cell), LOWER(cell), PROPER(cell)—Changing Case** These functions return the text in the indicated cell reference except with all the characters converted to uppercase, to lowercase, or to initial capitals (with the first letter of each word capitalized). For example, if cell M86 contains the words *Today's date*, =UPPER(M86) will return TODAY'S DATE, =LOWER(M86) will return today's date, and =PROPER(M86) will return Today's Date. This function can be useful when preparing to use the EXACT function, described below, which compares the contents of two cells.

If actual text is used as the argument in parentheses instead of a cell reference, remember to enclose the text in quotation marks.

**EXACT(cell1,cell2)—Compares Text Cells** This function compares the text in cell 1 with the text in cell 2. If both are exactly the same, a value of 1 (for true) is returned; if not, a value of 0 (for false) is returned. This result could be used in an IF function to provide the true or false condition. The two text strings must match exactly, character by character, and the function distinguishes between uppercase and lowercase letters (whereas using the equal sign to compare text ignores the case, so that "text" = "TEXT" yields a value of 1).

This function does not require arguments, but it may be used as the argument for the DAY, MONTH, YEAR, HOUR, MINUTE and SECOND functions. For example, MONTH(NOW) returns May if the current month is May.

**DATE(year,month,day) and DATEVALUE("text")—Date Values**

The DATE function returns a value for the date described as the number of the year, the month, and the day—all expressed as numbers in the argument; for example, DATE(85,5,28). Remember to separate the entries by commas.

How the result is returned depends on how the cell has been formatted. If the cell is numeric or text, the serial value is returned; for example, 31194. However, if the cell is formatted as a date cell, the correctly formatted date is returned; for example, 28-May-85.

DATEVALUE does the same, except it converts the text version of the date, as in DATEVALUE("28-May-85"). Remember to include the text portion in quotation marks.

**YEAR(value), MONTH(value), DAY(value)—Date Value Conversion**

These functions extract the number value for the function from the serial value for the date. The starting point is the serial value for the date; for example, 31194, which is the value for May 28, 1985. Then YEAR(31194) returns 85, MONTH(31194) returns 5 (the number of the month), and DAY(31194) returns 28 (the day of the month).

The value can be located in a cell reference or cell name, so that YEAR(B44) would work if cell B44 contains a date serial value. If you get a question mark in the cell or an inappropriate response (such as a time in response to a request for the year), check the cell format in the Range menu. A Time or Date format will cause errors. Format the cell for any numeric or text format.

**TIME(hour,minute,second), TIMEVALUE("text")—Time Values**

The TIME and TIMEVALUE functions perform for the time the same calculations that DATE and DATEVALUE perform for the date. TIME produces either the serial value for the time or, in a time-formatted cell, the formatted equivalent of the time. TIMEVALUE does the same, starting with time expressed as text. For example, you could use TIME(1,22,00) or TIMEVALUE("3:30:00 PM").

**HOUR(value), MINUTE(value), SECOND(value)—Time Value Conversion**

These functions extract the number value for the function from the serial value for the time. The starting point is the

**INDEX(range,column number,row number)—Value at Intersection** This function returns the value of the cell within the range that is at the intersection of the number of rows and columns given. *Column number* is the number of columns to count across from the leftmost column in the range. *Row number* is the number of rows to count down from the top row in the range. The result is the value in the cell so located.

**CELL(attribute,cell), CELLPOINTER(attribute)—Cell Attributes** These functions return a code that indicates the status of the selected cell. In the case of CELL, the cell reference is specified; in the case of CELLPOINTER, the cell is the currently active cell. *Attribute* is one of several possible attributes for the cell: entering the word *address* as the attribute returns the reference of the cell (for CELLPOINTER). *Row* returns the row number and *column* returns the column letter. *Type* returns *b* if the cell is blank, *t* if it contains text, and *n* if it contains a number. *Width* returns a number that corresponds to the number of times the letter *m* would fit into the cell.

*Format* returns the same kind of code displayed by the Show Attributes command on the Style menu to indicate the way in which the cell is formatted; for example, *sci* for Scientific format or *per* for Percent format.

**Calendar Functions** Jazz has calendar functions that allow calculations with dates, determination of specific dates, and reference to the current date. We've divided the 11 Jazz calendar functions into three groups: the Now function, the Date functions, and the Time functions.

Jazz keeps track of the calendar by converting dates into numbers by numbering every day from the year 1904 through the year 2040. For example, May 28, 1985, is day number 31,194. This allows Jazz to perform date calculations. Jazz likewise converts time into decimals by dividing the day into fractional parts of a day. For example, 8:04:00 AM is converted into 0.336111. We refer to these Jazz values as serial values in the descriptions below.

**NOW—Present Date and Time Value** The NOW function returns the serial value of the present date and time, as determined from the computer's internal clock. This value is updated each time the worksheet is recalculated.

**CHOOSE(*n*,*list*)—Choose *n*th Element from List** This function chooses the *n*th element from the list provided in the formula. For example, CHOOSE(1,5,6,7) asks for element number 1 of the list of three elements 5,6,7; the result is the number 5.

A more useful example is CHOOSE(SUM(N89 . . N95)/10,.05,.06,.07,.08). This example adds up the values in range N89 . . N95, divides them by ten, then uses that as the *n* to select one of the four following values. Note that if the result is more than 4, you'll get an ERR, so be sure you have enough elements to account for all possible answers.

The *n* must be a number; if it is a decimal, only the whole number portion is used, so it's not necessary to use the INT function first. The list of values can be numbers, text in quotation marks, formulas, or individual cell references; they cannot be ranges because CHOOSE won't find the *n*th element of the range.

**HLOOKUP(*selection*,*table*,*row*), VLOOKUP(*selection*,*table*, *column*)**  
**—Table Lookup** HLOOKUP and VLOOKUP are both functions that look up values on tables. The first looks up a horizontal table set up in rows, the second looks up a vertical table set up in columns.

In both cases, *selection* is the heading of the column or row title. In HLOOKUP, the function goes across the top row until it finds the cell that contains the text or number you've entered as the *selection*. In VLOOKUP, the function goes down the leftmost column of the table to find the *selection*.

*Table* is the range of the entire table including the column headings or row titles.

*Row* is a number. Having found the cell in the top row containing the *selection*, HLOOKUP counts down the column the number of rows or cells you've specified as *row* and returns the value of that cell. In effect, *selection* and *row* cross-index the horizontal table to find a specific cell. *Column* performs the related function for the VLOOKUP function.

**COLS(*range*), ROWS(*range*)—Number of Columns or Rows in Range** These functions count the number of rows or columns in the given range.

**N(*range*), S(*range*)—Numeric and String Values** These functions return the value of the top left cell in the given range. N returns a number and S returns text (text values are called strings). If the value in the cell is numeric, N returns the number, but S returns a blank. If the value in the cell is text, N returns a blank but S returns the text.

example, column L, the first column, is numbered 0; column M is 1, column N is 2, and column O is 3. Therefore, in our examples, the *column* entry will be the number 3, which is the number of the Index column, column O.

The *criteria* entry contains the cell references of the criterion being used for this function. In our examples, this will be P72 . . P73 to analyze Region 1, P74 . . P75 to analyze Region 2, and so on down column P, and Q72 . . Q75 to analyze Regions 1, 2, and 3; and Q76 . . Q78 to analyze Regions 4 and 5.

**DAVG(*input,column,criteria*)—Average of Data Range** This function averages the data in the specified cells. In our example, DAVG(L71 . . O83,3,P72 . . P73) averages the index values for the salespeople in Region 1, which is 97.5 percent. Simply change the *criteria* to average the performance of the salespeople in Regions 2, 3, 4, and 5 and for the two groupings of regions.

**DCOUNT(*input,column,criteria*)—Count Elements in Data Range** This function counts the number of cells in the selected range, excluding blank cells. In our example, DCOUNT(L71 . . O83,3,Q72 . . Q75) counts the number of salespeople in Regions 1, 2, and 3.

**DMAX(*input,column,criteria*), DMIN(*input,column,criteria*)—Maximum and Minimum Value in Data Range** These functions determine the maximum or minimum value among the selected cells. In our example, DMAX(L71 . . O83,3,Q76 . . Q78) would find the highest index figure for overseas Regions 4 and 5.

**DSUM(*input,column,criteria*)—Sum of Data Range** This function sums the values in the selected criteria cells.

**DSTD(*input,column,criteria*), DVAR(*input,column,criteria*)—Standard Deviation and Variance of Data Range** These functions determine the standard deviation and variance for the cells selected by the criteria.

**Special Functions** Jazz's special functions include the ability to look up tables of values, count the number of rows or columns in a range, and copy the contents of the cell where the cursor is located.

|    | L         | M         | N      | O     | P         | Q      |
|----|-----------|-----------|--------|-------|-----------|--------|
| 71 | Last Name | First     | Region | Index | Criterion |        |
| 72 | Abrams    | William   | 3      | 110%  | Region    | Region |
| 73 | Adams     | Samuel    | 4      | 98%   | 1         | 1      |
| 74 | Akins     | James     | 4      | 67%   | Region    | 2      |
| 75 | Allen     | Thomas    | 5      | 109%  | 2         | 3      |
| 76 | Almassa   | Robert    | 2      | 140%  | Region    | Region |
| 77 | Alpers    | Nancy     | 5      | 88%   | 3         | 4      |
| 78 | Caffrey   | Paula     | 1      | 94%   | Region    | 5      |
| 79 | Callahan  | MaryEllen | 3      | 77%   | 4         |        |
| 80 | Castle    | Robert    | 1      | 101%  | Region    |        |
| 81 | Coffey    | Eleanor   | 2      | 90%   | 5         |        |
| 82 | Connors   | Elizabeth | 4      | 112%  |           |        |
| 83 | Marques   | George    | 3      | 69%   |           |        |

**Figure 4.51:** The worksheet database for data range functions contains columns L, M, N, and O of data; column P has five criteria ranges, one for each region, and column Q has another two criteria that group several regions each.

for the criterion being used and the specific criterion entry. There may be several criteria; for example, in column N we will analyze the domestic regions 1, 2, and 3 together, and the overseas regions 4 and 5 together.

Now we're ready to do some analysis, using the data-range functions listed below. Each description below refers to Figure 4.51 for its examples.

Each data-range function calls for three elements: the *input*, the *column*, and the *criteria*. The *input* is the range that includes all the data and the column titles (row 71); in our example, this is L71 . . O69.

The *column* is the column whose data the functions will analyze; in our example, we'll be analyzing the indexes in column O. Unfortunately, you don't just enter the column letter; you must enter a number corresponding to the number of columns this column is to the right of the first column of the data range. Data range functions always count the first column of the data range as column 0. In our

|     | A         | B      | C |
|-----|-----------|--------|---|
| 92  | Sample    | Value  |   |
| 93  | 1         | 101    |   |
| 94  | 2         | 94     |   |
| 95  | 3         | 34     |   |
| 96  | 4         | 78     |   |
| 97  | 5         | 99     |   |
| 98  | 6         | 45     |   |
| 99  | 7         | 88     |   |
| 100 | 8         | 92     |   |
| 101 | 9         | 102    |   |
| 102 | Mean      | 81.44  |   |
| 103 | Std. Dev. | 23.61  |   |
| 104 | Variance  | 557.36 |   |

Figure 4.50: Calculating Standard Deviation and Variance.

**Data-Range Functions** Data-range functions apply the Jazz statistical functions, including SUM, to selected fields within a defined range on the worksheet. You select the criteria that define the fields on which the functions will operate.

All the data-range functions operate in the same way. First you must set up a data range, organized as a series of columns as shown in Figure 4.5T, so that it resembles a database. Or you can copy and paste sections from an existing file in your database module onto your worksheet.

Next, we select the criterion for doing the analysis. Criterion means which columns will determine the data on which to use the functions. In the case of our example, we'll do some analysis by region of how our salespeople met their goals. So we need five criteria, one for each of the five regions. These we enter as pairs of elements: the title of the Region column (Region), and the criterion (1, 2, 3, 4, or 5). The criteria must be placed outside the database area itself, anywhere on the worksheet. The criterion entry always lists at least two elements, as shown in column P: the column title

because the text cell is considered to have a value of 0, which Jazz will include as part of the range when dividing to get the average. A blank cell in the range is ignored.

**COUNT(range)—Count Cells in Range** COUNT counts<sup>†</sup> the number of cells in the range, including text cells but excluding blank ones. For example, this function would be useful in the formula =SUM(A20 . . A25)/COUNT(D75 . . E90), which adds up the values in one range and divides them by the number of elements in another range. You may list individual cells as well as a series of ranges, separated by commas, as in =COUNT(N4 . . N40,M4, L10 . . N11). (Those familiar with other Lotus products—1-2-3 and Symphony—will be glad to hear that Jazz has corrected the error that caused COUNT to return a value of 1 when counting a single cell, even if the cell was blank. COUNT in Jazz counts correctly.)

**MIN(range), MAX(range)—Minimum/Maximum Value In Range** The MIN and MAX functions return the minimum and the maximum value in the range or ranges given. These functions ignore blanks cells and consider text cells to have a value of 0.

**STD(range)—Standard Deviation** Standard deviation is a statistical function that shows how widely a group of numbers varies from the average or mean. A high standard deviation means the list of numbers varies widely in value from the average of the list, and a low standard deviation means most of the numbers in the list are very close to the average for the list. This helps determine how accurate an average is for a statistical grouping. A standard deviation is the distance from the mean that you must go to account for about 34 percent of the data in a normally distributed data set.

Figure 4.50 shows the standard deviation taken for the range B93 . . B101, a series of nine measurements. The average (mean) is 81, and the standard deviation is 23. This means that about 68 percent of the values fall in the range of 81 plus or minus 23 (a standard deviation on either side of the mean).

**VAR(range)—Population Variance** The VAR function is related to the standard deviation function. In fact, the variance is the square of the standard deviation; or rather, Jazz calculates the standard deviation by calculating the variance and then taking the square root. As with all statistical functions, blank cells are ignored and text cells are given a value of 0. See Figure 4.50 for an example of the use of this function.



|    | A                       | B                 | C |
|----|-------------------------|-------------------|---|
| 77 | INTERNAL RATE OF RETURN |                   |   |
| 78 | HEDGELY ARMS APARTMENTS |                   |   |
| 79 | Investment              | (\$100,000)       |   |
| 80 | Annual                  | \$30,000          |   |
| 81 | Rentals                 | \$30,000          |   |
| 82 |                         | \$30,000          |   |
| 83 | Sales Price             | \$5,000           |   |
| 84 | Return                  | -2.40%            |   |
| 85 | (formula:)              | IRR(.14,B79..B83) |   |
| 86 |                         |                   |   |
| 87 |                         |                   |   |

**Figure 4.49:** Calculating Internal Rate of Return for a property investment; the investment, \$100,000, is entered as a negative number (with a minus sign).

Simply change your estimate and try again. Remember to enter the estimate as a percentage or its decimal equivalent—we could have used either 0.14 or 14%.

**Statistical Functions** Statistical functions operate on ranges of worksheet numbers to give results such as the number of items in a list; the average, minimum, and maximum values; and standard deviation. SUM, described in the Mathematical Functions section, can also be considered a statistical function because it operates on a group of numbers.

**AVG(range)—Average** The AVG function adds up the elements in a list or range and divides the total by the number of elements to get the average (or mean) value. The elements may be a range, a series of ranges, or a list of individual cells separated by commas (for example, =AVG(A1 . . A5,B1,B4)). The cells must contain numeric values. A text cell in the range will cause the average to be incorrect

**NPV(*interest, range*)—Net Present Value** The NPV function is like the PV function except that it lets you enter a series of unequal payments over regular intervals, whereas PV requires each payment to be equal to the next. Enter the payment amounts in a column or row to establish the *range* of the formula. Then enter the interest rate for the periods in question. The *term* is not required because it is the total of the number of payments. As with PV, NPV discounts the future payments by the estimated interest rate to determine the present value of the investment.

**PMT(*principal, interest rate, term*)—Loan Payment** The PMT function calculates the periodic payments needed to pay off a loan at a given interest rate. For example, it can be used to calculate the monthly payments needed to pay a three-year, \$5,000 car loan at 14 percent interest, which comes to \$170.89 per month. Remember to use a percent sign with the interest rate and to conform the interest rate period and term period to the payment intervals. In other words, if the payments are in months, make the interest rate and term in months.

**IRR(*estimate, range*)—Internal Rate of Return** The IRR function estimates the internal rate of return, which is similar to the net present value in that it evaluates the actual yield on an investment returning a series of payments by comparing it with the initial investment. The series of payments, including the original investment, are listed in a column or row, as shown in Figure 4.49.

For this example, we plan to purchase an apartment building for \$100,000, collect \$30,000 rental income per year (overlooking, for this example, our cost factors), and then sell it for \$125,000. The question is, what is our return on investment?

We enter the figures in a column. The original investment is entered as a negative number, -100,000 (Jazz's Currency format displays this in parentheses), and the income and sale price are entered as positive numbers.

In cell B84 we enter the IRR function as =IRR(.14,B79 . . B83). The 0.14 is our estimate of what the internal rate of return percentage will be. Due to the nature of the mathematics involved, Jazz must do a series of approximations and needs a starting point. You provide this estimate, or guess, which doesn't have to be very accurate. If it is within several hundred percent of being correct, Jazz will be able to make the calculation almost instantaneously, in this case, 29.18 percent. If your guess is too far afield, Jazz will display ERR.

FALSE and TRUE can also be used as place-holders or to construct complex nested IF functions. =TRUE when entered in a cell returns a value of 1 and =FALSE returns a value of 0.

**Financial Functions** The Jazz financial functions are concerned with cash flows, loans, and rates of return.

**FV(payment, interest rate, term)—Future Value** The FV function determines the total amount that you would receive from investing a series of payments over a period of time at a certain interest rate. A common example would be to calculate the future value of your IRA. The *payment* is the amount received or invested at each interval. Enter *interest rate* as a percent (for example, 7.5%) or as a decimal (for example, 0.075), and make sure it corresponds to the payment interval. For example, if the payments are monthly and the interest rate is annual, divide the interest rate by 12 so it matches the period of the payments. Unfortunately, you must make the sometimes unrealistic assumption that the interest rate will remain the same through the course of the investment. For *term*, enter the number of payments being made. This must correspond to the payments. If they are annual payments, *term* would be the number of years, if the payments are monthly, *term* would be the number of months.

For example, to calculate the value of annual \$2,000 investments in an IRA at 9 percent interest over 20 years, use the formula =PV(2000,9%,20). The result is \$102,320.24.

**PV(payment, interest rate, term)—Present Value** The PV function determines the true cost of an investment that will make payments over a period of time. It determines, in effect, the discount at which you can value an ordinary annuity. For example, if you are offered an annuity of \$1,000 per year for five years at a cost of \$3,000, the PV function will show you what this investment is worth to you. Enter into the formula the payment amount, \$1,000 per year; your discount rate, which is the minimum interest rate that is acceptable to you for this type of investment, say, 9 percent per year; and the period of five years. The formula is PV(1000,9%,5) and yields \$3,890 as the amount you could pay for this investment and get the minimum interest rate you desire.

Since the annuity offered costs only \$3,000, this investment meets your requirements.

IF formulas can get quite complex, since the *condition*, the *then*, and the *else* can all consist of further functions or formulas, including additional IF functions and lookup tables, and the *then* and *else* results can be text as well as numbers. The result can be very much like working in a programming language, with complicated multiple conditions resulting in further calculations, further evaluations, and even phrases being constructed and displayed in cells. As with all programming, keeping track of the program logic becomes important and sometimes requires working out the logical flow on paper. This investment of time and effort can be worthwhile when the resulting worksheet can be used repeatedly.

**ISNA(x), ISERR(x), ISREF(x), ISBLANK(x), ISSTRING(x), ISNUMBER(x)—Checking Cell Contents** These functions check the contents of the cell reference entered as *x* and return a value of 1 (true) if the cell matches the condition, or a value of 0 (false) if it does not. ISNA checks if the cell contains the holding entry NA (for not available), and ISERR checks if the cell contains the error message ERR. These two functions can be used as error traps. ISREF checks if the cell contains the message REF; ISBLANK returns a value of 1 if the cell is empty, ISSTRING returns a value of 1 if the cell contains a text entry, and ISNUMBER returns a value of 1 if the cell contains a numeric entry.

**TRUE, FALSE, NA, ERR—Special Entries** These are place-holding functions that are used while constructing complex formulas or worksheets. =NA is placed in a cell when you expect formulas to refer to that cell, but the cell isn't ready to provide the needed data. So, rather than allow ERR to appear in all the dependent cells or let the cells have inaccurate results, you can put =NA in the first cell and any cell whose formula refers to this cell will also display a value of NA. Later you can replace the NA in the original cell with a real value, and all the formulas depending on that cell will recalculate and produce real results. This lets you distinguish between a deliberate missing piece in the worksheet and actual errors that result in the ERR display.

ERR can be used as an error flag to notify you under certain conditions that something has gone wrong. Jazz will always display this message in case of an erroneous recalculation, but you can also create a formula that will warn you if a value exceeds a limit. For example, IF(A11 > = 10000,ERR,B12) will display ERR in the cell if the value in A11 exceeds 10,000.

**ASIN(x), ACOS(x), ATAN(x), ATAN2(x,y)—Arcsine, Arccosine, Arc-tangent of Value (x)** The arc functions return angles, in radians, where *x* is the sine, cosine, or tangent. In other words, they reverse the SIN, COS, and TAN functions. To convert radians back to degrees, multiply by 180/PI.

ATAN2 is the four-quadrant arctangent for the angle whose tangent is *y/x*.

**PI—Value of Pi** This function returns the value of pi, the ratio of the circumference of a circle to its diameter, to seven places: 3.1415927.

**Logical Functions** Logical functions determine certain conditions. The exact condition, and what happens once that condition is determined, depends on which function is being used. These functions generally check a cell, value, or result of a formula to see if it matches certain conditions. The ISNA function, for example, checks a cell to see if it contains the NA (not available) result. All of the logical functions, except IF, return a value of 1 if the condition is determined to be true, and a value of 0 if the condition is not true. In this case, *true* means "meets the condition" and *false* means "doesn't meet the condition."

The 1 or 0 is put in the formula cell, or if the logical function is part of a larger formula, the 1 or 0 is returned to the next part of the formula.

Note that the relational operators—equal, not equal, greater than, less than, etc.—also act as logical functions; they return values of 1 or 0. For example, the formula `=32>5` will put a value of 1 in the cell because 32 is greater than 5. It is also possible to compare text entries, if they are put inside quotation marks: `A19="YES"` is a valid entry (but only for equal and not equal; because greater than and less than have no meaning with text). (Don't put the range names in your formulas in quotation marks.)

**IF(condition,then,else)—The If Function** IF, the most commonly used logical function, is a branching function. If the *condition* is determined to be true, then the action listed as *then* is taken; otherwise, the action listed as *else* is taken. This corresponds to the if-then-else functions common to many programming languages.

For example, `=IF(A14>100,0.15,0.12)` means IF the value in A14 is greater than 100, THEN 0.15 will be returned, ELSE if not, 0.12 will be returned.

cell. To generate whole random numbers, multiply the function by the necessary power of ten. For example,  $\text{INT}(\text{RAND} * 10)$  gives a random number between 0 and 9. A new random number is generated each time the worksheet is recalculated. If you want a random number but don't want it to change with each recalculation, enter **RAND** in the entry box and click the Calculate icon. A random number will be generated, which you can then use as a permanent randomly generated number.

**SQRT(x)—Square Root** The square root function returns the square root of  $x$ . Only positive values can be used in  $x$ .  $\text{SQRT}(x)$  has the same effect as the expression  $x^{1/2}$ .

**EXP(x), EXP1(x)—Natural Exponents** These functions use the value of  $e$ , which is 2.7182818, the base for the system of natural logarithms.  $\text{EXP}(x)$  raises  $e$  exponentially by the value of  $x$ ;  $\text{EXP1}(x)$  does the same, except that it subtracts 1 from the result.

**EXP2(x)—Powers of Two** This expression raises 2 to the power of  $x$ . For example,  $\text{EXP2}(5)$ —two to the fifth power—returns 32.

**SCALE(x,y)—Scaling Function**  $\text{SCALE}$  multiplies  $x$  by the value of 2 to the power of  $y$ . The function always uses the integer of whatever value is entered as  $y$ .

**LN(x), LN1(x), LOG(x)—Logarithms**  $\text{LN}(x)$  provides the natural logarithm, or log base  $e$ , of  $x$ ;  $\text{LN1}(x)$  also returns the natural log of  $x$  but adds 1 to the result.  $\text{LOG}(x)$  returns the logarithm base 10, or common logarithm, of  $x$ .

**MOD(x,y)—Modulo, or Remainder, of (x)** This function returns the remainder (modulo) that results from dividing  $x$  by  $y$ . Note that  $y$  cannot be zero since division by zero results in an error. Both  $x$  and  $y$  must be integers.

### **Trigonometric Functions**

**SIN(x), COS(x), TAN(x)—Sine, Cosine, Tangent of Angle (x)** These functions return a value corresponding to the ratio between selected sides of a right triangle, given the size of the angle between two of the sides. The value of  $x$  must be given in radians. To convert from degrees to radians, multiple degrees by  $\pi/180$ .

contain the **argument**, or specific information needed for your situation. For example, in the function **ABS(x)**, the letter **x** stands for the argument that you'll put in parentheses. The argument can be a number: **ABS(-5)**; an arithmetic expression: **ABS(-5\*2)**; a cell reference: **ABS(A54)**; and in some cases a range, range name, or another complete function with its own arguments: **ABS(SUM(A22 . . A50))**. Examples of arguments using cells, ranges, and other functions are given in the following sections. Remember to close all open parentheses.

The results of the function are placed in the cell in which the function is written. This is called **returning** the value or result.

### **Mathematical Functions**

**ABS(x)—Absolute Value** Absolute value is the positive form of the value, obtained by dropping any negative sign that may be present. The **x** can be a value, cell, or function. **ABS(B19)**, **ABS(B24\*B25)**, and **ABS(SUM(B24 . . B28))** are all valid.

**CPYSGN(x,y)—Copy (x) With Sign Of (y)** This function copies the value of **x** but with the sign (positive or negative) of **y**. For example, **CPYSGN(D12,A12)** gives the value in cell D12 the sign that cell A12 has. If cell D12 is 16 and cell A12 is -90, the result -16 will be put in the cell containing this formula.

**INT(x)—Integer Value** The integer function returns the integer of the value **x**, obtained by dropping off (not rounding) any decimal portion of the value. For example, **INT(B12)** returns 10 if the value in cell B12 is 10.556.

**ROUND(x,n)—Round (x) to (n) Places** The **ROUND** function rounds a value to the nearest number, using **n** to determine to how many places. **ROUND(B12,2)** rounds the value from cell B12 to two decimal places. **ROUND(B12,0)** rounds the value from cell B12 to an integer (no decimal places). **ROUND(B12,-2)** rounds the value from cell B12 to the nearest hundred, and **ROUND(B12,-3)** rounds it to the nearest thousand, which can be useful in financial projections.

**RAND—Random Number** This function does not require an argument. It returns a random decimal number between 0.0 and 1.0 to the number of decimal places specified in the format of the

remain unchanged. In the case of A\$1, for example, moving the cell containing that formula down two rows and over five columns will result in a formula with F\$1 in the formula; the row remained at 1 while the column reference moved over by five columns.

### **Mathematical Operators**

**Arithmetic Operators** Jazz offers basic arithmetic operators: plus or positive (A+B), minus or negative (A-B), an asterisk for multiplication (A\*B), and a slash for divide (A/B). It also offers exponentiation, for raising a number to a power (A^2 means A squared, A^3 means A cubed) or taking its root (A^1/2 means the square root, A^1/3 means the cube root).

**Relational Operators** Relational operators include equal (A=B), not equal (A<>B), greater than (A>B), greater than or equal to (A>=B), less than (A<B), and less than or equal to (A<=B). Examples of the use of relational operators are included in the Logical Functions section.

**Logical Operators** Three logical operators are used: logical NOT (#NOT#), logical AND (#AND#), and logical OR (#OR#). The logical operators are commonly used as arguments with the logical functions described later in this section. These operators are used to determine if a value meets prescribed conditions. For example, the partial formula IF(A21=#NOT#200... determines whether cell A21 contains the value 200; if it does **not**, then #NOT# is considered to be true for the IF function (the IF function is described later in this section). Logical NOT is similar to the operator <> (not equal).

The same formula using logical AND would read IF(A21=100 #AND#A22=50 . . . , and it would be considered true only if **both** cell A21 had a value of 100 and cell A22 had a value of 50. Logical OR in such a situation would read IF(A21=100#OR#A22=50 . . . , in which case it would be considered true if **either** expression were true. Further examples are included in the description of logical functions later in this section.

**Built-In Functions** Jazz offers a number of built-in functions that can use cell references as values. In the function descriptions that follow, the function name is followed by parentheses which



references and displays the Circular Reference icon on the console line. When you click the icon, one of the cells causing the circular reference will be highlighted for correction. (In cases where you intended the circular reference, see the Advanced Range Commands section for how to set the number of iterations desired during recalculation.)

**Absolute References** The issue of absolute references arises when you wish to refer in a formula to a cell reference that must remain unchanged even if the cell containing the formula is moved or pasted. Normally, when a cell is moved or pasted, the formula it contains is adjusted to the cell's new location. When adding a column of numbers, for example, reproducing the summing formula across several columns results in a series of summing formulas, each of which has been adjusted to add the numbers in its own column. Such formulas use what are called relative references because they refer to cells whose exact references are relative to the formula cell's reference. A relative reference formula such as `=SUM(B1 . . B10)` contained in cell B11 is understood by Jazz to be saying, "Add the ten cells directly above." If this formula is moved to column C, the formula still adds up the ten cells directly above, which are now C1 . . C10. The formula changes relative to the cell's location.

There will be occasions, however, when you want the cell reference to be absolute rather than relative because the cell contains a special value, such as a tax rate or baseline assumption figure, that is used by several formulas elsewhere in the worksheet. It is convenient in such circumstances to consolidate such assumptions in one location, so if the assumptions change, only one cell needs to be updated to update the entire worksheet. Such a cell location is called an absolute reference, as opposed to relative reference. Absolute references must be noted at the time the formula is being entered into the cell.

To note an absolute cell reference, precede the cell column letter and the cell row number with a dollar sign: A75 becomes `$A75`. If you use the mouse to select the cell reference while entering a formula, the Absolute icon appears on the console line. With each cell selected, click the Absolute icon to enter the dollar signs automatically. You can always go back and edit a formula to insert the dollar signs if desired.

A mixed reference, such as `$A1` or `A$1`, has an absolute column and a relative row or an absolute row and a relative column. In such cases, moving or pasting the formula causes the relative portion to adjust to the new location, but the absolute portion will

It's possible to put a formula in the entry box and have it evaluated on the spot, while it's still in the entry box, by clicking the Calculate icon that appears on the right side of the console line when the formula is entered. The value of the formula replaces the formula in the entry box. You can then use the value to build a further formula, or you can enter it into the cell by pressing Return.

**Errors in Formulas** There are four basic kinds of formula errors. First, there are errors that result in the wrong answers. The solution is to double-check all formulas to make sure that the correct cell references, accurate formulas, and relevant assumptions are used. Printing a copy of the finished worksheet using the Show Attributes command on the Style menu is one way to help find errors. Another is to write out assumptions directly on the worksheet. The Hide Values option available when you use the Protection command on the Range menu makes it possible to have a record of your assumptions and explanation of the steps taken without cluttering up your final worksheet.

The second kind of error results in Jazz issuing the message: **This formula is invalid**. Check that all parentheses are properly paired; that you have the right number of arguments for all functions, with each argument in the proper form and order; and that you've spelled the function name correctly (or use the Enter Into Formula command on the Edit menu to let Jazz type the function name for you). Any text in a formula (other than function names) must be in quotation marks. Combining two pieces of text in a formula requires an ampersand; if you use a plus sign you will get the warning message.

The third kind of error is one which results in the word **ERR** being displayed in the cell. This commonly occurs when you refer in a formula to a cell that contains the wrong kind of value for the formula. For example, if B1 is an empty cell (empty cells are considered to have a value of zero), then the formula  $=A1/B1$  will result in ERR because you can't divide by zero. If you try to perform the wrong kind of operation on dates or on text—for example, if you entered  $=A1/B1$  and cells A1 and B1 both contain names—you'll get ERR because you can't sensibly divide Sam by Harry.

The fourth type of error is the circular reference, discussed in the Advanced Range Commands section. In this error, formulas in two cells refer to one another, so that every recalculation of the worksheet results in a new value for both cells. (A circular reference also arises if a formula refers to its own cell.) Jazz detects circular

**(Warning:** When the entry first appears in the edit box, it is highlighted, and if you press the Backspace key, the entire item disappears. However, pressing Return will not replace the original entry with blanks, so simply double-click the cell again to replace the contents.) The original entry is shown in the contents box for reference. Press Return to replace the original entry with the edited material or click the Cancel icon to cancel the edit and retain the original entry.

Another way of selecting a cell for entry or edit is to type its reference into the selection box. Highlight the selection box by dragging the cursor across it, then press the Backspace key to delete the current selection. Type the cell reference; it will be highlighted. Ranges can also be highlighted in this way.

**Editing within a Range** When a range is highlighted, the active cell (the outlined cell in the range) can be edited. To change the active cell in the highlighted range without turning off the range highlighting, click the Corner Navigator icon on the right side of the console line. This rotates the active cell among the four corners of the range. You can also press the Tab key to move the active cell marker cell by cell through the range. When the desired cell is active, choose the Open Cell command from the Edit menu. If you simply double-click the active cell, the range highlighting will disappear.

It's also possible to extend an existing highlighted range. To do this, shift-click—hold down the shift key while clicking the cursor—on a cell outside the existing highlighted area. The range highlighting will expand to include that cell as one of the corners of the new highlighted range. Alternatively, you can reduce the highlighted area by shift-clicking a cell within the highlighted range.

**Entering Formulas** To begin a formula, start with an equal sign. If you forget the equal sign, Jazz will treat the formula as text or as an invalid entry. When you type the equal sign, Jazz recognizes words such as INT and SUM as functions rather than text. Formulas are entered in standard algebraic fashion. Operations can be nested so that functions act as arguments for other functions. Parentheses can be used to group expressions and to override the natural order of calculation. Formulas referring to other cells use the value displayed in those cells to solve the formula. If the other cell contains a formula, Jazz recalculates that formula first to ensure that it has the latest value before solving the first cell's formula.

as well as some calendar and logical functions, are described in this section. (Another nine built-in Jazz functions, used only with the database module, are discussed with database reports the Chapter 3.)

**Entering and Editing Numbers and Text** Entering numbers and text into worksheet cells is simple. Highlight the desired cell by clicking the cursor on it. The cell reference appears in the selection box on the left side of the console line, and the current contents of the cell, if any, are displayed in the contents box. A cursor blinks in the entry box. As you type the entry, it appears in the entry box. Edit the entry by using the Backspace key to delete or the mouse to move the cursor. To cancel the entry, click the Cancel icon that appears on the right side of the console line when you start typing. To accept the entry and place it in the cell, press the Return or Enter key or click the worksheet cursor on another cell. Whatever you entered replaces whatever was already in the cell. If you entered a formula, the formula is evaluated and the resulting value is placed in the cell (unless you've formatted the cell for Formula Text, in which case the formula is displayed in the cell).

Jazz knows the difference between numbers and words, and inserts quotation marks before any text you type (the quotation marks only appears in the contents box, not in the cell). Jazz formats the entry according to the format for that cell, depending on whether you entered a number or text. You can force Jazz to treat a number as if it were text (for example, if you are numbering columns or labeling them with a numerical code or date) by preceding with quotation marks.

When entering numbers, don't use dollar signs, percent signs, or commas within the numbers; if you do, you'll get an "invalid formula" message. Just enter the number itself, and let the Format option in the Range menu format the worksheet so dollar signs, percent signs and commas are automatically added by Jazz.

**Editing Entries** To Edit the existing entry in a cell, double-click the cell. Its contents will appear in the entry box, highlighted. Move the cursor to the point in the entry where you want to make your alteration, and then click. The highlighting disappears, and you can type added material, use the Backspace key to delete, and move the cursor back and forth in the entry for further editing. You can also delete several characters in the entry box by dragging the cursor across them to highlight them, and then pressing the Backspace key.

- **Show Values and Show Attributes.** These commands lets you see the values you've entered and the attributes you've assigned to each cell. Show Values is usually active (shown by the check mark next to it). If you select Show Attributes, the worksheet format and protection settings are displayed, as in Figure 4.48. Each cell becomes two lines, with the top line showing the formula or the number that you entered in that cell. The second line displays codes showing the type of format selected for that cell, whether **cur 2** (Currency with two decimal places) or **bar** (Bar Graph), or **per 2 p** (Percent, two decimal places, protected cell). To change back to the normal display, select Show Values.

**Formulas and Functions** The Jazz worksheet makes it easy to manipulate numbers. Jazz offers some 90 built-in functions that can be used along with mathematical operators to create formulas on the worksheet. These functions, which include mathematical, trigonometric, financial, statistical, and data selection functions,

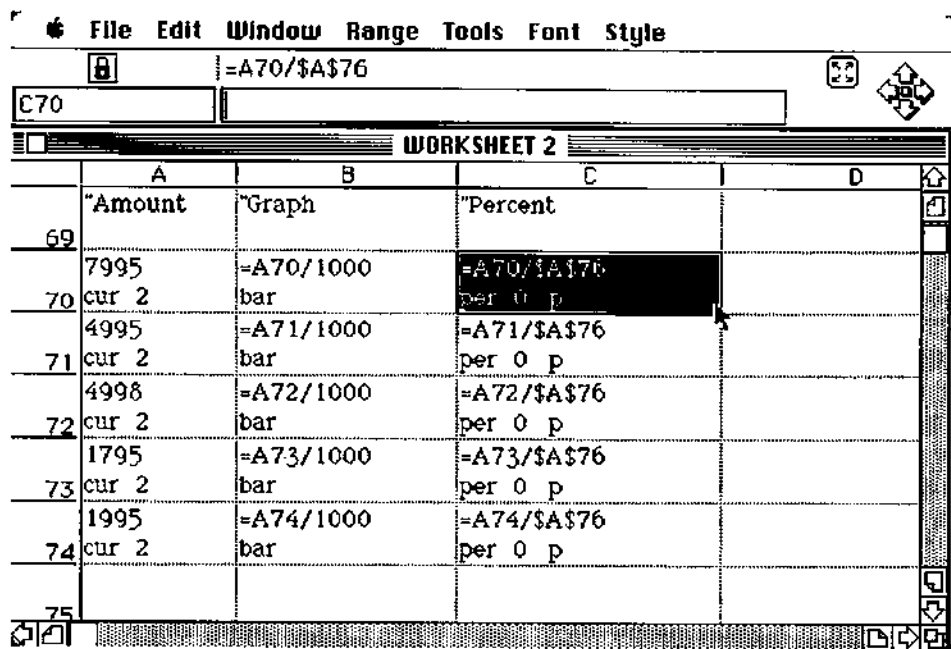


Figure 4.48: Show Attributes displays format settings.

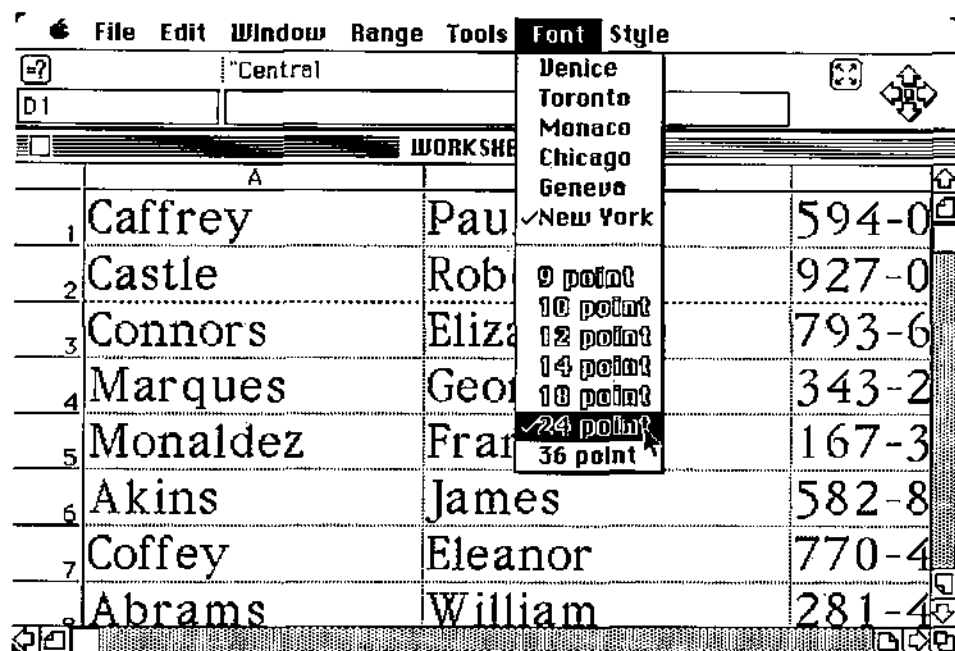


Figure 4.46: Sight for sore eyes: New York 24 point.

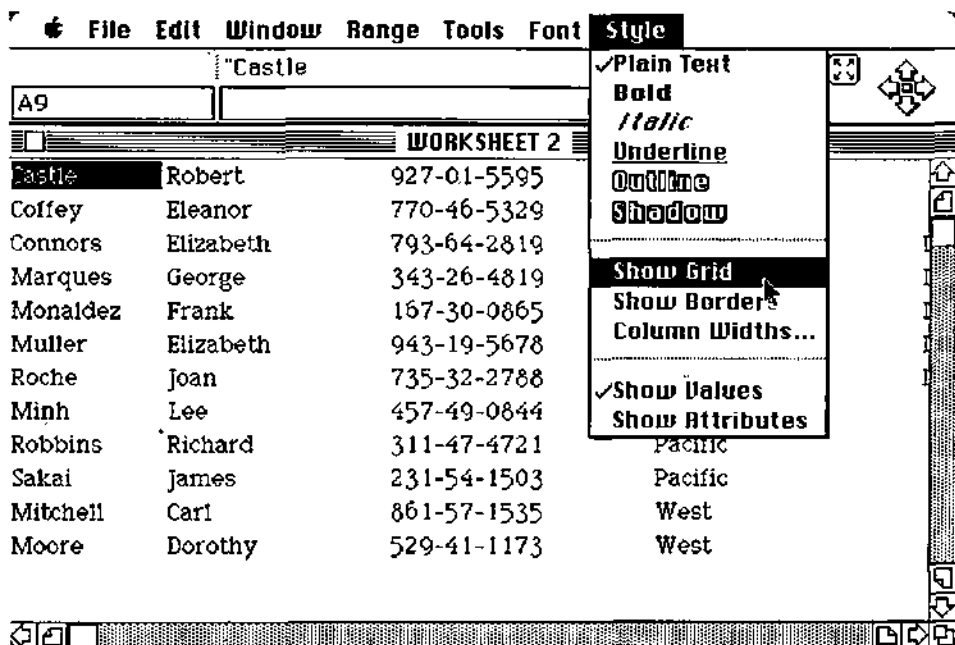


Figure 4.47: Worksheet with grid lines and borders hidden.

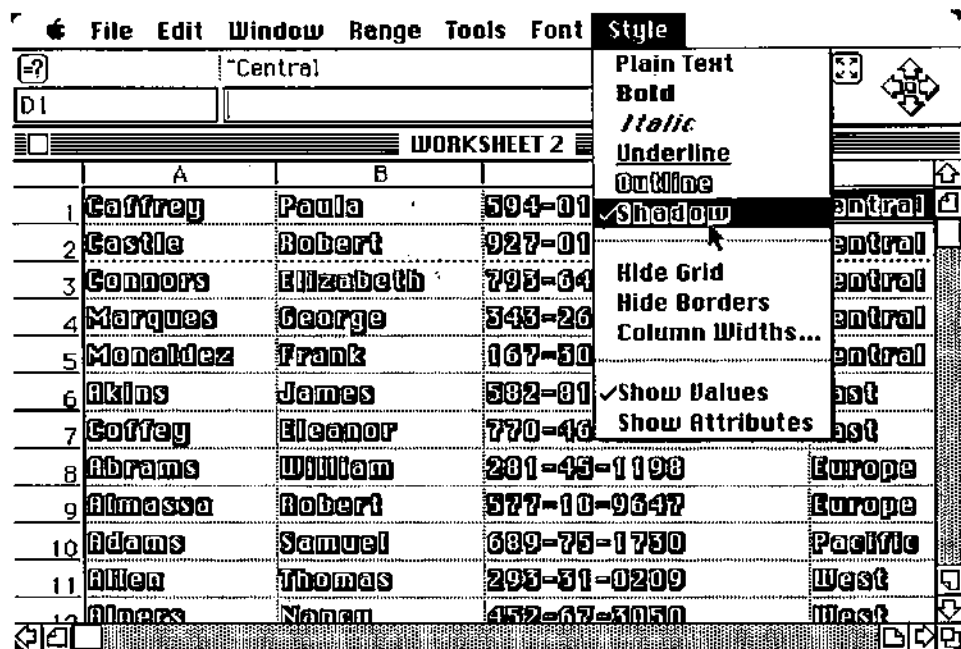


Figure 4.45: Using Shadow style with Chicago 12 point.

After a long day of laboring over a worksheet filled with numbers, it can be refreshing to raise the type size by a point or two to make it easier to read. This characteristic of the Macintosh is also a blessing to those with vision problems, as demonstrated in Figure 4.46.

The other commands on the Style menu are:

- **Hide Grid** and **Hide Borders**. These commands delete the grid lines and the column letters and row numbers, as shown in Figure 4.47. You might want to use these commands just before printing or when you're pasting the worksheet into a word processor document.
- **Column Widths**. This command lets you select the default, or standard, column width for your worksheet. If you highlight an entire column or group of columns, you also are given a Restore Default Width to Selected Columns option. When chosen, this option changes the column width of the highlighted columns to the default width you've chosen.

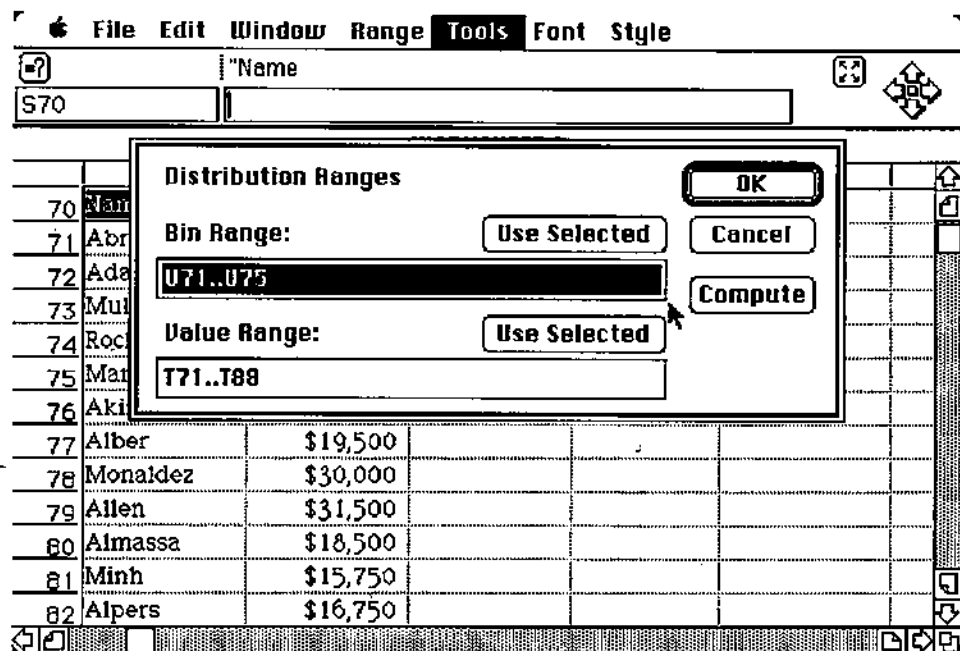


Figure 4.43: Set Distribution Ranges display.

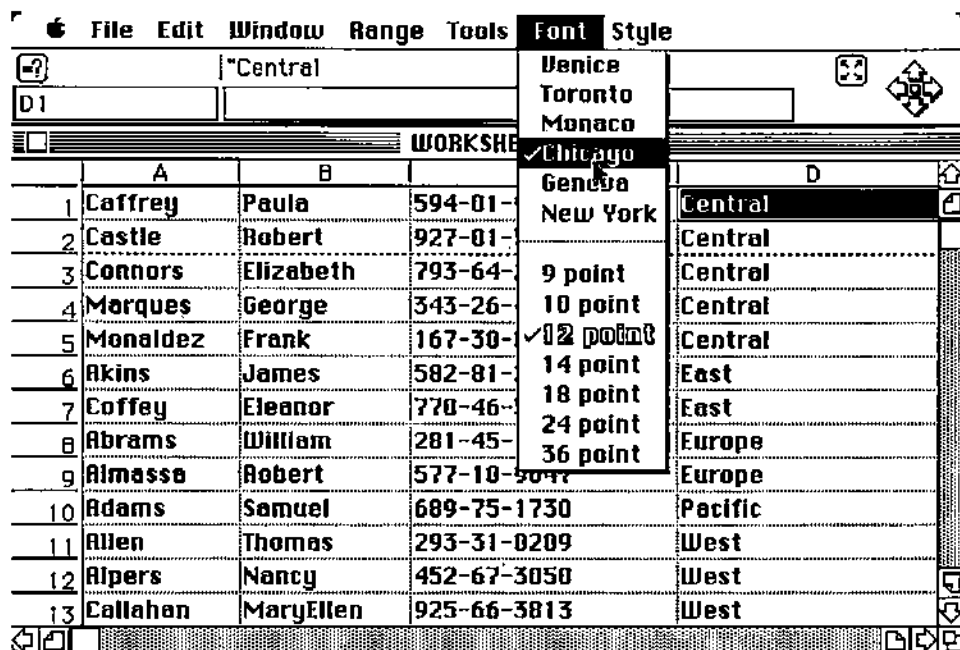


Figure 4.44: Using Chicago 12 point.



|    | S        | T        | U             | V        | W |
|----|----------|----------|---------------|----------|---|
| 70 | Name     | Salary   | Ranges        | No./Empl |   |
| 71 | Abrams   | \$11,900 | \$12,000      | 1        |   |
| 72 | Adams    | \$12,300 | \$15,000      | 2        |   |
| 73 | Muller   | \$17,950 | \$20,000      | 6        |   |
| 74 | Roche    | \$24,000 | \$25,000      | 5        |   |
| 75 | Marques  | \$27,900 | \$30,000      | 3        |   |
| 76 | Akins    | \$24,000 | Over \$30,000 | 1        |   |
| 77 | Alber    | \$19,500 |               |          |   |
| 78 | Monaldez | \$30,000 |               |          |   |
| 79 | Allen    | \$31,500 |               |          |   |
| 80 | Almassa  | \$18,500 |               |          |   |
| 81 | Minh     | \$15,750 |               |          |   |
| 82 | Alpers   | \$16,750 |               |          |   |

**Figure 4.42:** Using the Frequency Distribution command, Column W shows the number of employees whose salary (column T) falls within the ranges given in column V.

individual figures have been grouped into a more manageable number of categories, Jazz's graphics module could be used to illustrate the salary ranges graphically.

**Font and Style Commands** The Font and Style menus permit changes of font, style, and type size, as shown in Figures 4.44 and 4.45. The entire worksheet is changed at once, to minimize memory consumption in the worksheet. Experiment to find a typeface you prefer.

If you want to change fonts, type size, or type style for only a portion of the worksheet, copy and paste the worksheet into a word processor document, where font and style changes can be accommodated easily.

Notice that each font has suggested type sizes, indicated in the Font menu by outline-style lettering. Other type sizes look sketchy when displayed. The current selections are checked.

**Set Distribution Ranges** Frequency distribution is an impressive term for a pretty simple concept. Figure 4.42 shows a portion of a table of salaries paid to 18 employees on the administrative staff at WidgeCo.

To understand the pattern of salaries at the company, we've broken the salary ranges into broad categories and put them in column V. Now we'll use Jazz to count how many people fit into each category. (Such counting is a simple but time-consuming and error-prone task for a human.) Select **Set Distribution Ranges** from the **Tools** menu. The **Distribution Ranges** box shown in Figure 4.43 appears.

In the box next to **Bin Range**, enter (or if highlighted, click **Use Selected**) the column in which the ranges are listed (in our case, V71 . . V76). These are called bins into which the individual salaries will be sorted and then counted by Jazz. Next, enter the range of the values to be sorted, in our case T71 . . T88. Then click **Compute**, and you should get the result shown in Figure 4.42. Now that the 18

|   |       |         |         |         |         |         |         |
|---|-------|---------|---------|---------|---------|---------|---------|
| File Edit Window Range Tools Font Style |       |         |         |         |         |         |         |
| =V48*W48                                |       |         |         |         |         |         |         |
| V49                                     |       |         |         |         |         |         |         |
| WORKSHEET 2                             |       |         |         |         |         |         |         |
|   | V     | W       | X       | Y       | Z       | AA      | AB      |
| 48                                      |       |         |         |         |         |         |         |
| 49                                      |       | \$2,000 | \$3,000 | \$4,000 | \$5,000 | \$6,000 | \$7,000 |
| 50                                      | 8.5%  | \$170   | \$255   | \$340   | \$425   | \$510   | \$595   |
| 51                                      | 9.0%  | \$180   | \$270   | \$360   | \$450   | \$540   | \$630   |
| 52                                      | 9.5%  | \$190   | \$285   | \$380   | \$475   | \$570   | \$665   |
| 53                                      | 10.0% | \$200   | \$300   | \$400   | \$500   | \$600   | \$700   |
| 54                                      | 10.5% | \$210   | \$315   | \$420   | \$525   | \$630   | \$735   |
| 55                                      | 11.0% | \$220   | \$330   | \$440   | \$550   | \$660   | \$770   |
| 56                                      | 11.5% | \$230   | \$345   | \$460   | \$575   | \$690   | \$805   |
| 57                                      | 12.0% | \$240   | \$360   | \$480   | \$600   | \$720   | \$840   |
| 58                                      | 12.5% | \$250   | \$375   | \$500   | \$625   | \$750   | \$875   |
| 59                                      | 13.0% | \$260   | \$390   | \$520   | \$650   | \$780   | \$910   |
| 60                                      | 13.5% | \$270   | \$405   | \$540   | \$675   | \$810   | \$945   |

Figure 4.41: Results: Values automatically computed for the whole table.

this is a two-way table, we're using two dummy (scratchpad) cells. The first, V48, always stands for the column of variables, and the second, W48, stands for the row of variables.

Now highlight the entire table—V49 to AC60—which includes the formula, the column of variables, and the row of variables. Select Set Table Ranges from the Tools menu and click 2-Way Table. This activates a second entry box. Click Use Selected for the Table Range, click the box next to Input Cell 1, and type in V48 (if you forget the exact cell reference, you can check the entry box at the top of the screen where it appears as part of the formula). Then click the second box and type W48 for Input Cell 2. Now click Compute, and you should get the results in shown Figure 4.41.

Although they are exacting to set up, such tables can generate ranges of data which you can use elsewhere in the worksheet or graph to determine the effects of variables on key elements of your plan.

|    | V       | W       | X       | Y       | Z       | AA      | AB |
|----|---------|---------|---------|---------|---------|---------|----|
| 47 |         |         |         |         |         |         |    |
| 48 |         |         |         |         |         |         |    |
| 49 | \$2,000 | \$3,000 | \$4,000 | \$5,000 | \$6,000 | \$7,000 |    |
| 50 | 8.5%    |         |         |         |         |         |    |
| 51 | 9.0%    |         |         |         |         |         |    |
| 52 | 9.5%    |         |         |         |         |         |    |
| 53 | 10.0%   |         |         |         |         |         |    |
| 54 | 10.5%   |         |         |         |         |         |    |
| 55 | 11.0%   |         |         |         |         |         |    |
| 56 | 11.5%   |         |         |         |         |         |    |
| 57 | 12.0%   |         |         |         |         |         |    |
| 58 | 12.5%   |         |         |         |         |         |    |
| 59 | 13.0%   |         |         |         |         |         |    |

Figure 4.40: In this two-way table, the formula is entered conveniently at V49, and the dummy scratchpad cells are V48 and W48.

Notice that 1-Way Table is already selected. For Table Range, since you've already marked off the range, click Use Selected. V49 . . W60 appears in the box, as in Figure 4.38. Move the cursor to the box for Input Cell 1 and click, then type V49, which is the blank cell used in the formula as the scratchpad cell. (Alternately, you can click OK, return to the worksheet, highlight V49, select Set Table Ranges again, and click Use Selected for Input Cell 1.)

Now that you've filled in the boxes, either click Compute in the Table Ranges box or select Compute Table from the Tools menu. The results—the present value of, say, a bond paying \$2,500 a year for seven years, given current interest rates—are shown in Figure 4.39 (unless you forgot to format column W as currency).

A two-way table is calculated in a similar manner. In Figure 4.40, we'll calculate the interest on amounts ranging from \$2,000 to \$8,000, at interest rates of 8.5 to 13.5 percent. This time, we put the formula at the intersection of the column and the row of variables, because the range used in the Tables Range box must contain the formula as well as the variables, and this is a convenient way to do it. The formula is simply the interest rate times the amount. Since

|    | U                 | V     | W                 | X | Y | Z |
|----|-------------------|-------|-------------------|---|---|---|
| 48 |                   |       | Net Present Value |   |   |   |
| 49 | Periodic Payments |       | \$17,500          |   |   |   |
| 50 | \$2,500           | 8.5%  | \$12,796          |   |   |   |
| 51 | \$2,500           | 9.0%  | \$12,582          |   |   |   |
| 52 | \$2,500           | 9.5%  | \$12,374          |   |   |   |
| 53 | \$2,500           | 10.0% | \$12,171          |   |   |   |
| 54 | \$2,500           | 10.5% | \$11,973          |   |   |   |
| 55 | \$2,500           | 11.0% | \$11,780          |   |   |   |
| 56 | \$2,500           | 11.5% | \$11,593          |   |   |   |
| 57 |                   | 12.0% | \$11,409          |   |   |   |
| 58 |                   | 12.5% | \$11,231          |   |   |   |
| 59 |                   | 13.0% | \$11,057          |   |   |   |
| 60 |                   | 13.5% | \$10,887          |   |   |   |

Figure 4.39: Results of net present value calculation, using Jazz's one-way table.

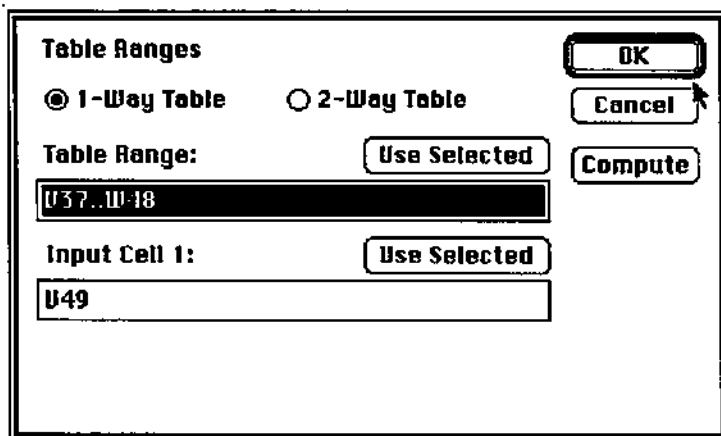
Finally, we put the formula in cell xW49, just above where the results will appear. The formula is NPV(interest rate, range containing periodic payments). The range, which we named Payments (also for convenience), can be seen in the entry box at the top of the screen in Figure 4.37. Now comes the tricky part. Don't use V50 (the first of the interest rates) in the formula for the interest rate; instead, use a dummy cell—any blank cell. In this case, we used V49. Jazz will use this cell as a scratchpad while doing the calculations (although it's so fast you won't see anything happen). A one-way table needs one dummy cell, which it refers to as Input Cell 1.

The resulting formula is =NPV(V49,payments). When you press Return, you'll get a value equal to the sum of U50 . . . U56; in other circumstances, you might get ERR, a question mark, or strange numbers. It really doesn't matter what you see at this point because we're not done yet.

For display reasons, you'll probably want to format column W as currency with no decimal places and column V as percent with one decimal.

The next step, now that the table is set up, is to inform Jazz of the locations needed. First, highlight the table, including the variables column (V), the cell containing the formula (W49), and the column where the answers will go (W50 . . . W60) as shown in Figure 4.37.

Now use the Set Table Ranges command on the Tools menu. The Table Ranges box shown in Figure 4.38 appears.



---

**Figure 4.38:** Use Set Table Ranges to define the table and the input cell.

File Edit Window Range Tools Font Style

Central

D1

WORKSHEET 2

|    | A        | B         | C           | D       |
|----|----------|-----------|-------------|---------|
| 1  | Caffrey  | Paula     | 594-01-9252 | Central |
| 2  | Castle   | Robert    | 927-01-5595 | Central |
| 3  | Connors  | Elizabeth | 793-64-2819 | Central |
| 4  | Marques  | George    | 343-26-4819 | Central |
| 5  | Monaldez | Frank     | 167-30-0865 | Central |
| 6  | Akins    | James     | 582-81-2780 | East    |
| 7  | Coffey   | Eleanor   | 770-46-5329 | East    |
| 8  | Abrams   | William   | 281-45-1198 | Europe  |
| 9  | Almassa  | Robert    | 577-10-9647 | Europe  |
| 10 | Adams    | Samuel    | 689-75-1730 | Pacific |
| 11 | Allen    | Thomas    | 293-31-0209 | West    |
| 12 | Aipers   | Nancy     | 452-67-3050 | West    |
| 13 | Callahan | MaryEllen | 925-66-3813 | West    |

Figure 4.36: The sorted range.

File Edit Window Range Tools Font Style

V49..W60

WORKSHEET 2

|    | U                 | V     | W                 | X | Y | Z |
|----|-------------------|-------|-------------------|---|---|---|
| 48 |                   |       | Net Present Value |   |   |   |
| 49 | Periodic Payments |       | 117,500           |   |   |   |
| 50 | \$2,500           | 8.5%  |                   |   |   |   |
| 51 | \$2,500           | 9.0%  |                   |   |   |   |
| 52 | \$2,500           | 9.5%  |                   |   |   |   |
| 53 | \$2,500           | 10.0% |                   |   |   |   |
| 54 | \$2,500           | 10.5% |                   |   |   |   |
| 55 | \$2,500           | 11.0% |                   |   |   |   |
| 56 | \$2,500           | 11.5% |                   |   |   |   |
| 57 |                   | 12.0% |                   |   |   |   |
| 58 |                   | 12.5% |                   |   |   |   |
| 59 |                   | 13.0% |                   |   |   |   |
| 60 |                   | 13.5% |                   |   |   |   |

Figure 4.37: Determining net present value assuming a range of interest rates.

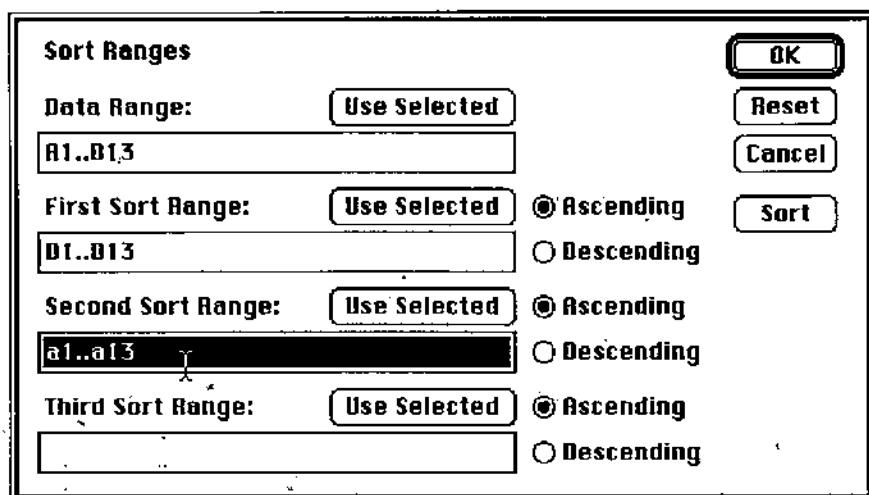


Figure 4.35: The Sort Ranges box.

the second key, we highlighted the names in column A and entered that range next to Second Sort Range.

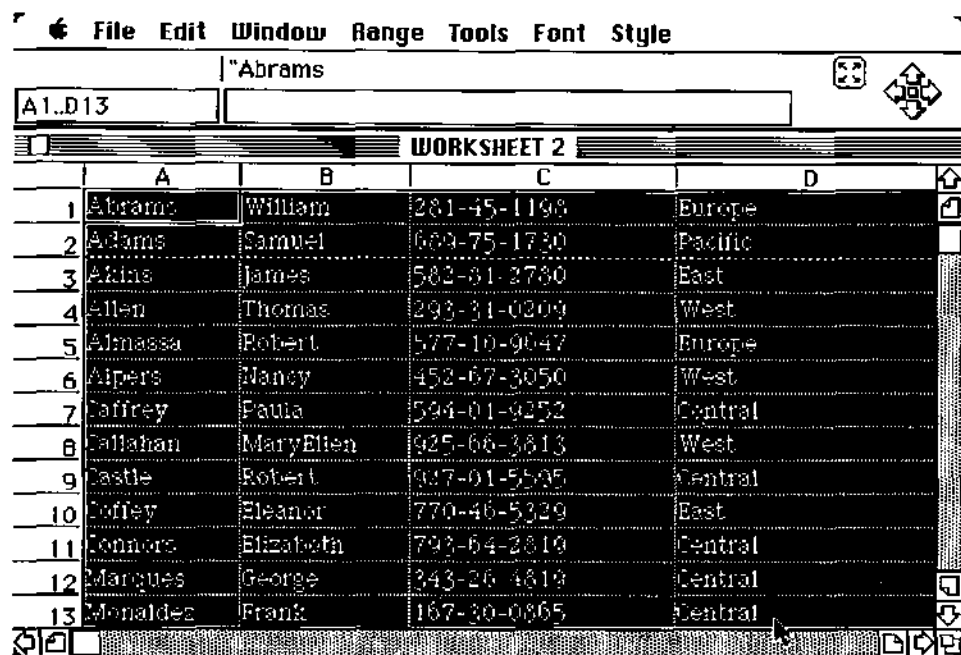
We then clicked Sort, and the results of the sort are shown in Figure 4.36. Note that the names are in order within each region.

You can also click the Sort command on the Tools menu. For example, you might want to resort the data after you've made some changes.

**Advanced Tool Commands** The advanced commands on the Tool menu are Set Table Ranges and Set Distribution Ranges.

**Set Table Ranges (One- and Two-Way Tables)** Jazz provides a method of computing one- and two-way data tables, also called what-if tables. An example of a what-if table is shown in Figure 4.37.

This table will calculate the present value of a series of future payments made over the next seven years if we assume that the prevailing interest rates range from 8.5 to 13.5 percent. First, according to the requirements of the net present value function in Jazz, we put the periodic payments of \$2,500 each in the U50 . . . U56 range. Next, we set up the table by putting the assumed interest rates in column V, in half-point increments (using the Fill command for convenience). These are the variables—because there is only one list of variables, this is a one-way table.



**Figure 4.34: Selecting a range to be sorted.**

You begin by selecting the area to be sorted, then choose **Set Sort Ranges** from the **Tools** menu. The **Sort Ranges** box shown in Figure 4.35 appears.

The **Data Range** is the area to be sorted. Include all the data that you want to be included in the sort. Beware; if there are any spaces included in the range, they will also be sorted. If you have highlighted the data-sort area, just click **Use Selected** to have that range entered into the box. Alternatively, you can type in the range (in the case of Figure 4.34, the range is **A11 . . D20**).

Most sorts are one-key sorts. You sort by last name, for example. In a two-key sort, you would set the second key as the first name, so that if there are two people with the same last name, they will be sorted in order of their first name. If you used a third key, say the social security number, that would distinguish between people with the same first and last names.

In our example, we're sorting by region and by last name within each region. So to fill in the **First Sort Range**, we clicked **OK**, went back to the worksheet and highlighted the **D11 . . D20** range, then called up the **Sort Ranges** box again and clicked **Use Selected**. For

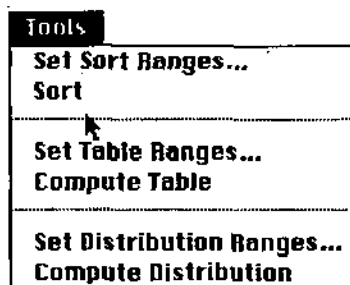


erasing the data in the cell, whether directly or through cutting, clearing, pasting, or filling.

- **Enforce Protection Settings.** This option is crucial to the whole operation because any protection that you have selected is active only when this box is clicked. When the box is not checked, protection is not enforced for any range on the worksheet. For example, if you have one range with Check Entry Format protection, another with Hide Values, and a third with Prevent Entry, when you activate Enforce Protection Settings at any point, all three ranges have their individually selected type of protection activated. If you turn off Enforce Protection Settings at any point, all three ranges will have their protection suspended.

**Common Tools Commands** The tools on the Tools menu, shown in Figure 4.33, are used for sorting, creating one- and two-way tables, and calculating frequency distribution. We'll review sorting in this section. The other tools are discussed in the Advanced Tool Commands section.

**Sorting Data** You can sort columns of data on the worksheet by using the Sort command on the Tools menu. Sorting is straightforward. You tell Jazz the area to be sorted and which columns you want to use for sorting. These columns are the keys Jazz uses when it rearranges the entries. Figure 4.34 shows a data range to be sorted. The data in column D are the first sort key, and the data in column A are the second key. You can select up to three key columns.



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**Figure 4.33:** The Tools menu.

the Protection Settings box displayed when you select Protection from the Range menu (see Figure 4.32).

The Protection Settings box contains the following options:

- **Check Entry Format.** This option causes Jazz to make sure that what you enter into a cell matches the format setting. If the format has been set for a date, time, number, or text, Jazz will only accept an entry in that form. For example, if you enter text in a Currency formatted cell, Jazz will beep and highlight the offending material in the entry box. (Note, however, that the Enforce Protection Settings option must also be checked, as discussed below.)
- **Hide Values.** This option causes Jazz to display blanks instead of the actual entries. Although they are not displayed, the entries are still active and can be used in other formulas.
- **Prevent Entry.** This option gives you the traditional cell protection. When activated, it prevents anyone from overwriting or

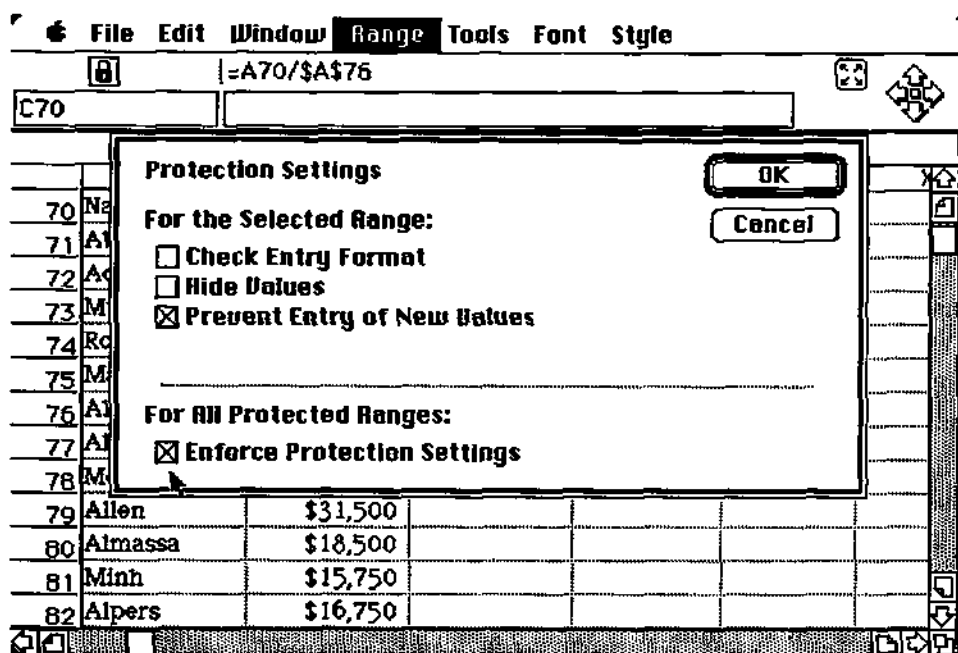


Figure 4.32: The Protection Settings box.

the cell is formatted for time, this will be converted to a specific AM/PM time. If it is formatted for Date, you'll get a question mark. If you want a result that is in actual hours, Jazz requires you to multiply the formula by 24. For example, if cell A84 contains 8:47 AM and cell A90 contains 6:10 PM, subtracting one from the other to obtain 9.38 as the number of hours difference requires this formula:

**(A90 - A84) \* 24.**

**Formula Text** is a way of displaying formulas instead of their values. This is similar to the Show Attributes command on the Style menu, except that Show Attributes affects the entire worksheet. Although only the formula is shown, the values are still there, and the cell or range can be used in other formulas without difficulty.

**Recalculation Order** The Recalc Settings command on the Range menu lets you determine the order in which Jazz recalculates the worksheet. When you select this command, the box shown in Figure 4.30 appears. The default order, called Natural Order, is to first calculate, for each formula, all other formulas and functions on which it depends. When you select By Columns, Jazz recalculates column by column, left to right, and top to bottom. The By Rows option recalculates row by row, top to bottom, and left to right.

This becomes important in a circular or forward reference. In a forward reference, a formula refers to the results of another formula elsewhere on the worksheet. If the second formula is not calculated until later, the first formula is probably not up to date. Natural Order would figure out that the second formula needs to be calculated first, and would do it, thus eliminating the forward-referencing problem. In a circular reference, each of two formulas refers to the other, so that neither is ever up to date. Jazz notifies you of a circular reference by displaying the Circular Reference icon on the console line.

If, for some reason, a forward or circular reference is necessary (for example, in a mathematical problem requiring a series of approximations), you can set the Iteration Count option to cause Jazz to recalculate up to 255 times each time you ask for a recalculation. This iteration is only active when there is a circular reference or when the recalculation order is By Columns or By Rows.

**Protection** Jazz performs standard worksheet protection by permitting you to lock certain areas of the worksheet so that they cannot be altered. Two other forms of protection are also offered in

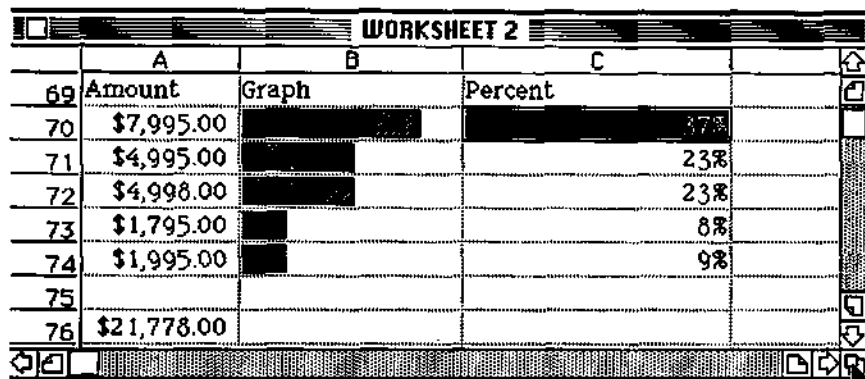


Figure 4.31: Bar Graph of the numbers in column A (divided by 1,000 for sizing purposes).

to one of the correct formats, Jazz will convert the date to the correct display format you've chosen for that range. Furthermore, if the cell is not already formatted for date and time, it will be formatted based on the way you entered the date or time. For instance, if you enter 23:50 into a previously unformatted cell, Jazz will recognize that as a 24-hour time and format the cell as HH:MM (24-hour).

The Date formats let you spell out the first three letters of the month or enter the month as a number. If you use one digit for the month, the initial zero will be inserted. If you use dashes in a cell formatted for slashes, they'll be converted to dashes, and vice-versa.

To use dates in formulas, don't type the date or time directly into the entry box. Instead, put the dates and times into cells on the worksheet, then refer to those cells. For example, subtract two cells containing dates or times.

The result that you obtain using a date or time in a formula will be based on the Jazz date- and time-numbering system, by which Jazz internally keeps track of dates by assigning each date its own number. If you subtract two dates, the answer will be in numbers of days, which you'll have to convert to weeks, months, and years if desired. If that cell is formatted as Date, you'll have those days converted into a fictitious date, based on Jazz's internal date list, or else you'll get a question mark indicating that Jazz doesn't have a date equivalent to that number. If the cell is formatted as Time, you'll also get a question mark in the cell.

If you subtract two times, the answer you get will be in Jazz's time-numbering system (for example, 18:10 - 8:47 gives 0.39097222). If

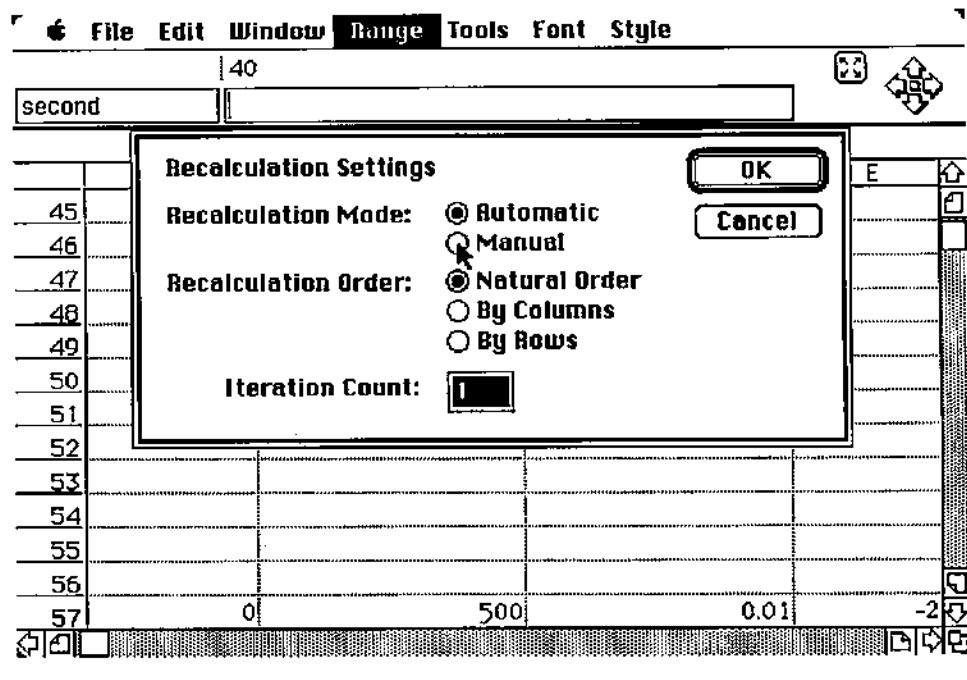


Figure 4.30: Recalculate Settings box.

ten to the sixth power, or  $1.0 \times 10E6$  in scientific notation, and 1,560,000 is  $1.560 \times 10E6$ . Jazz's **Scientific** format abbreviates these to 1.0E6 and 1.56E6. In the default General format, Jazz switches to Scientific format whenever a number won't fit in the cell at its current width. If the column is later widened, the number is converted back to regular notation. If you select Scientific format, all numbers are expressed this way. If you've selected any other format, a number too large to fit in the cell is displayed as three dots until the column is widened.

**Bar Graph** is a format that displays numbers as a bar graph in the selected range (as in Figure 4.31). Again, if your display shows three dots instead of a bar graph, widen the column to make room. If this requires an excessively wide column, try dividing the numbers in the bar graph column by a power of ten, since the bar graph is designed to show relative rather than absolute size. In Figure 4.31, the numbers in column B are divided by 1000 to reduce them to a useful proportion.

The **Date** and **Time** formats conform date and time entries to one of four formats each. As long as you enter dates and times according

**Set Titles/Page Break** The Titles commands lock rows at the top of the screen or columns at the left of the screen, which allows you to see column or row labels while making entries elsewhere on the worksheet. You must start with column A and row 1, but you can include several additional columns and rows. For example, columns A, B, and C can be locked.

To lock the top rows, select one or more rows starting with row 1; to lock left columns, select one or more columns starting with column A. When the columns or rows are selected, the commands Set Left Titles and Set Top Titles are activated on the Range menu. You can set both top and left titles. When you've set titles, Cancel Titles is offered as a command on the Range menu.

If you select a row or column other than the first, your command on the Range menu becomes Set Page Break; the column or row marked becomes the beginning of a new page when the worksheet is printed out. Select the same column or row again and use the Clear Page Break command on the Range menu to delete this page break.

**Recalculation Settings** Every time you make an entry on the worksheet, Jazz checks the entire worksheet and recalculates all formulas. If you're entering a lot of data, you can turn off this automatic recalculation by choosing Recalc Settings from the Range menu and then selecting Manual. Figure 4.30 shows the Recalculation Settings box.

When you select Manual, Jazz won't recalculate the worksheet until you tell it to. There are two ways to tell Jazz to recalculate:

- Use Command-R from the keyboard.
- Click the Recalculate icon that appears in the upper left corner of the console line.

The Recalculation Order options in the Recalculations Settings box are discussed in the Advanced Range Commands section.

**Advanced Range Commands** In this section, we discuss advanced formats, the Recalculate Order option, and the Protection command on the Range menu.

**Advanced Formats** Scientific notation is a method of expressing very large or very small numbers as powers of ten. One million is

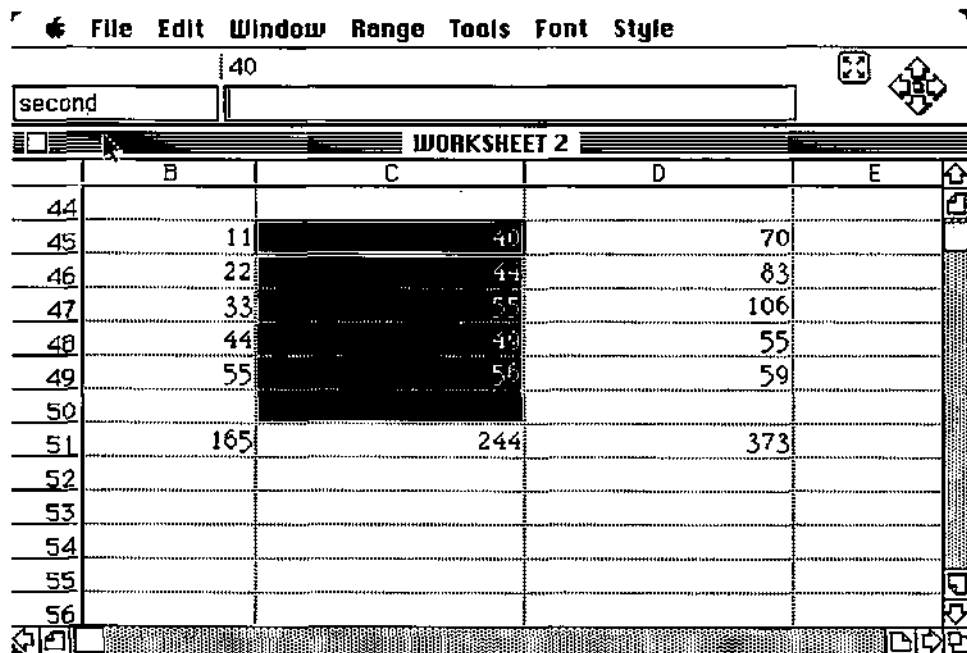


Figure 4.29: The name of the selected range, "second," appears in the Selection box.

- The name can be up to 15 characters long, including spaces between words in the name.
- Certain symbols or words cannot be used. Cell references like B15 or Z99, for example, are illegal names. Remember, too, that the worksheet extends out to column IV, so names like DS1 are also illegal because they too are cell references. Mathematical symbols like the equal sign or plus and minus can't be used anywhere in a name.
- You can use absolute reference with named ranges by preceding the range name with a dollar sign, just as if it were a cell reference. For example, the formula  $=\$Tax\ Rate * M44$  will stay the same no matter where you move the cells in that range. Otherwise, if you move a cell containing a formula referring to a named range, the formula will adjust to the new location just as with any relative reference (see the Formulas and Functions section for more about absolute reference).

To give a cell or range a name, select the desired cell or range, then choose Name from the Range menu. Type in a name and press the Return key.

To see what names you've used and which cells they refer to, select Review Names from the Range menu. You'll see the display shown in Figure 4.28.

Click a name to see the range or cell to which it refers. You can delete the selected name by clicking Discard. If you discard a name that was also used in formulas, the name in the formula will automatically be replaced by the cell reference. For example, Tax Rate\*M44 would become B5\*M44 if you discarded the name Tax Rate.

Click on the boxed name to change the name. All formulas using the old name will automatically update to the new name. Click another name, or click Done to return to the worksheet.

You'll also see the name of a selected range or cell in the Selection box (see Figure 4.29).

A named cell or range can be used anywhere the cell or range reference itself would make sense. For example, the formula Tax Rate\*M44 will work if Tax Rate refers to one cell, but it won't work if the name refers to a range like C46 . . C49 because you can't multiply a range.

You can even use the SUM function on a range. If the name April refers to the range C45 . . C50, then =SUM(April) is a valid formula that will add up the elements of the April range.

The following are some tips for naming cells and ranges:

- Capitalization doesn't matter; Jazz converts all names to lowercase.

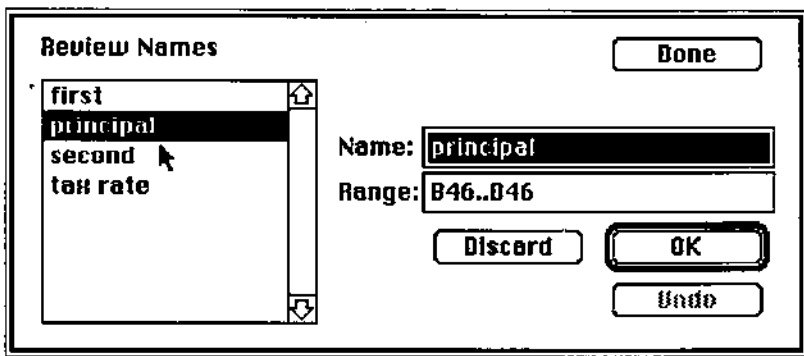


Figure 4.28: The Review Names display.



To change the width of a column, move the cursor to the dividing line between lettered columns. The cursor changes to a line with opposite-facing arrows to show you've reached the right spot. Hold down the mouse button and move the cursor right or left to expand or contract the column width. Release the button when you've reached the desired width.

To change the width of **several** columns, select a range of whole columns. Then move the border of one of them; the rest will duplicate your action so all are widened or contracted the same amount, as shown in Figure 4.27. If they are different widths to begin with, they'll all be the same width when you're done.

**Naming Cells and Ranges (the Name and Review Names Commands)** You can give names to cells and ranges to avoid having to remember exact cell references. Naming cell B5 something like Tax Rate makes it easier to write formulas such as Tax Rate\*M44 without having to go back and look up where you put the tax rate figure on the worksheet. There are some things you can do with named cells and ranges, and some things you can't do with them.

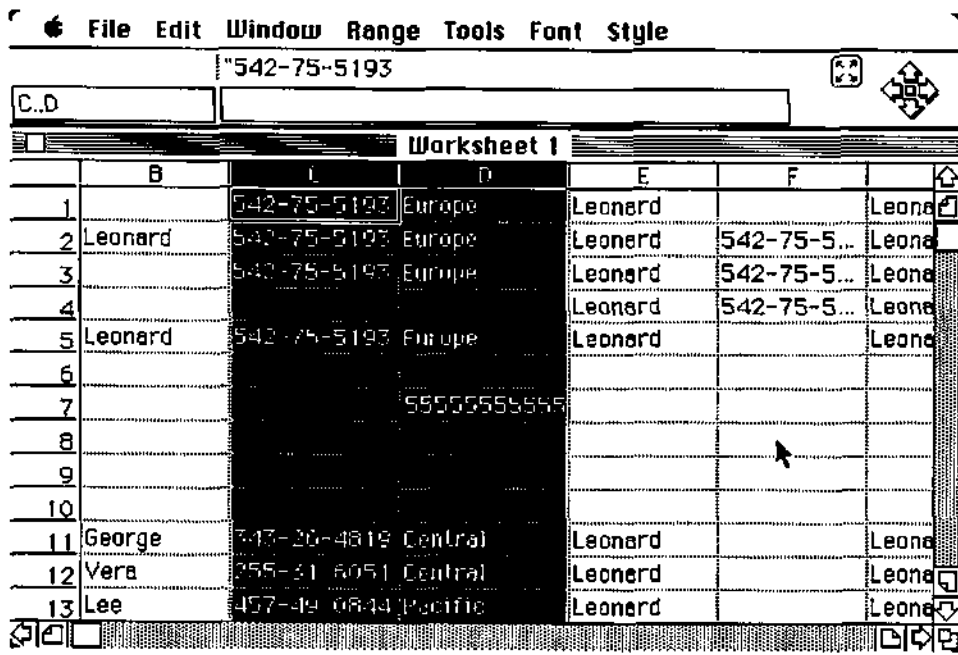


Figure 4.27: Changing the width of two columns at the same time.

**Tip:** For other currencies, use Fixed with the proper number of decimal places, and enter the currency name at the top of the column. To enter the currency symbol, use the special keyboard codes:

|                        |   |                 |
|------------------------|---|-----------------|
| Option-4               | ¢ | (cents)         |
| Option-3               | £ | (British Pound) |
| Option-y (lowercase y) |   | (Japanese Yen)  |
| Option-f (lowercase f) |   | (Dutch Gilder)  |

(Not all will be displayed with all fonts. If the symbol is not available in a given font, it will be displayed as a box.)

**Percent** converts the value in the cell to a percentage, including a percent sign and the number of decimal places chosen. The number 1, for example, is converted to 100%.

**Comma** simply adds commas in numbers like 100,000 and 1,000,000 to make it easier to read. (Many spreadsheet programs don't offer this capability.)

**General** is the default setting for numerical display. Numbers are flush right, and if they are too large to fit in the cell, they are expressed in Scientific format.

**Text** format lets you change the way text is displayed. Text can be against the left side of the cell, against the right side, or centered in the cell. Also note that if the cells to the right of the text entry cell are empty, extra text can spill over into the neighboring cells.

However, note that the Repeat option will not allow spillover. Repeat is used to create underlines and other special repeated markings. Use the underline or equals key to generate a one-cell underline or double underline. Enter a repeating pattern of @, #, + or other symbols or combinations of symbols, then copy the cell across a row to isolate or highlight sections of the worksheet. (Note: Because the equal sign marks the beginning of a formula, to use it as a character you must precede it with quotation marks.)

**Default** is used to return a range to the default setting for the whole worksheet, which is either the General format for numbers and Text Left for words or whatever other default format you selected using the Default Numeric and Default Text format settings on the Format display.

One option you won't find listed in the format display is **Change Column Widths**. This is because Jazz has a much simpler way of selecting column widths than entering numbers in a menu: Simply drag the column's borders to the width desired.

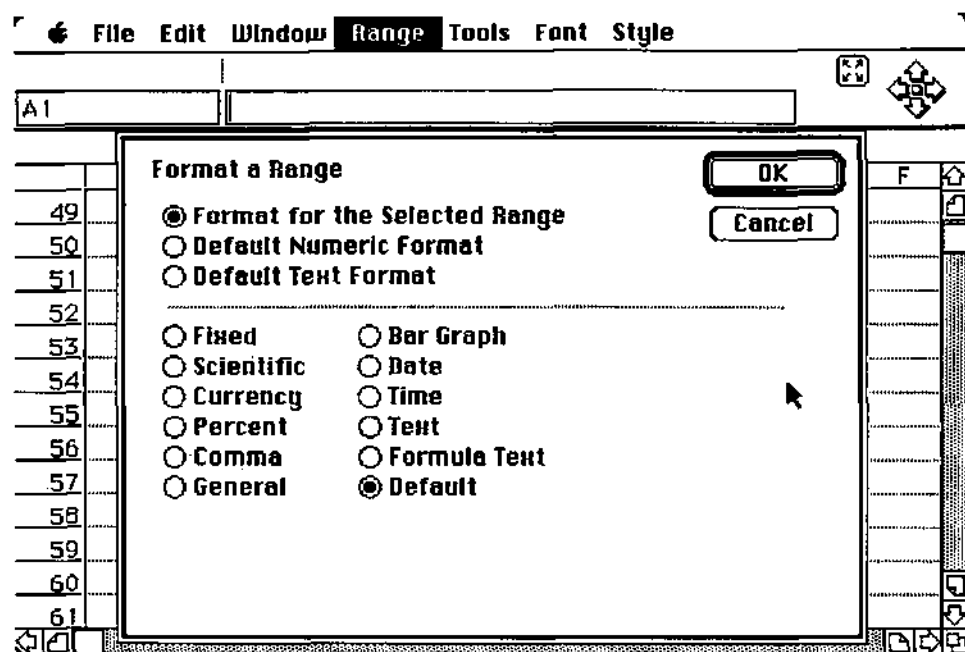


Figure 4.26: The Format Display.

To change the format of a specific range, first select the range on the worksheet, then call up the Format display. Select Format for the Selected Range if it's not already checked. Then move down to the lower half of the display and select the desired format. Answer any additional prompts that may appear, and choose OK to implement the format or Cancel to change your mind and end the format selection. Or change the format selection—experimenting is easy.

Fortunately, although there are many format selections, most are straightforward and easy to understand.

**Fixed** format means everything is displayed with the same number of decimal places. Use the arrows to select the desired number of decimal places, up to 15, from the additional selection that is displayed when you check the Fixed option. When you OK the selection, the range chosen is instantly converted to the desired number of decimal places.

Another popular selection is **Currency**, which displays dollars and cents, including a dollar sign and two decimal places (or you can eliminate the cents and just use dollars).

next value, -28. We changed the stop value to -100, a number well below where we expected this Fill operation to go.

Fill is useful for numbering portions of the worksheet. Fill can be used with the Table command, discussed in the Advanced Tools Commands section of this chapter, to create a table of calculations based on incremented values.

**The Format Command** Use the Format command to change the way numbers and text are displayed on the worksheet. The default display when you open a worksheet has the following format:

- Text is flush left against the left side of the cell.
- Numbers are flush right.
- If numbers are too large to fit into the cell, they are displayed in the Scientific format (see Advanced Range Commands). If the cell is widened, the number is displayed normally again.
- Anything else too large to fit into the cell has the first few characters displayed, followed by several dots to indicate that there's more.

You can change the format for any range, or change the default format for the entire worksheet, by selecting Format from the Range menu and viewing the Format display shown in Figure 4.26. In that figure, we've highlighted the selections we'll cover in this section; the rest are discussed in the Advanced Range Commands section.

To use the Format display, first choose which of the three options you're using:

- **Format for the Selected Range.** Check this if you're choosing a format for a range you've already selected on the worksheet.
- **Default Numeric Format.** Check this if you're selecting the format to be used as the default format for this worksheet. When this option is selected, the formats that don't apply are dimmed. Select the format desired, and it will be saved with the worksheet on disk.
- **Default Text Format.** Check this if you're selecting the format to be used as the default for text entries. When this option is selected, everything except Text is dimmed, and the selections Left, Right, Center, and Repeat are offered. Select the desired text format.

|    | A | B  | C   | D    | E   |
|----|---|----|-----|------|-----|
| 56 |   |    |     |      |     |
| 57 |   | 0  | 500 | 0.01 | -25 |
| 58 |   | 1  | 525 | 0.03 | -28 |
| 59 |   | 2  | 550 | 0.05 | -31 |
| 60 |   | 3  | 575 | 0.07 | -34 |
| 61 |   | 4  | 600 | 0.09 | -37 |
| 62 |   | 5  | 625 | 0.11 | -40 |
| 63 |   | 6  | 650 | 0.13 | -43 |
| 64 |   | 7  | 675 | 0.15 | -46 |
| 65 |   | 8  | 700 | 0.17 | -49 |
| 66 |   | 9  | 725 | 0.19 | -52 |
| 67 |   | 10 | 750 | 0.21 | -55 |
| 68 |   |    |     |      |     |

Figure 4.25: Five examples of Fill.

value is the highest value you'll allow in the fill list. Figure 4.25 shows five examples of the Fill command used to fill ranges of ten cells in each column.

In Column B, we used the default values. We started at 0, and incremented by 1 until we reached the final cell in the range. Notice that even though the stop value was 8191, Fill stopped at 10 because it ran out of cells. Column E shows what happens if we change the stop value to 5. In this case, Fill runs into the stop value before reaching the end of the range, and stops filling. (The default stop value of 8191, by the way, corresponds to 1 less than the maximum number of cells in a Jazz worksheet column.)

Column C starts at 500 and increments by 25 for each cell. Column D starts at 0.01 and increments by 0.01. Column E uses negative numbers. It starts at -25, decrements by -3 each time until it reaches -55. When working with negative numbers, you must change the stop value to reflect the numerical direction you're going. If you leave the positive value as 8191, nothing will happen because the start value, -25, is closer to the stop value than the

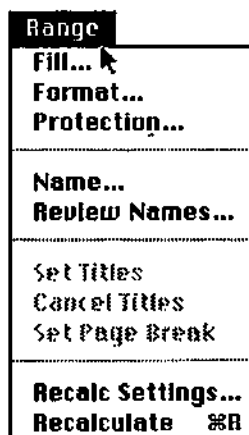


Figure 4.23: The Range Menu.

the remaining Format commands, the ins and outs of Protection, Page Break, and more on Recalculation Settings.

**The Fill Command** Fill is a command for entering lists of numbers automatically. Fill starts at one number, adds a selected amount and enters that in the next cell, adds the selected amount again and enters it in the next cell, and so on until it had filled the selected range.

To use this command, first, select a range to be filled. Next, select Fill from the Range menu. Figure 4.24 shows the Fill display that appears.

The **start value** is the number you'll start with, the **step value** is the increment or amount that will be added each time, and the **stop**

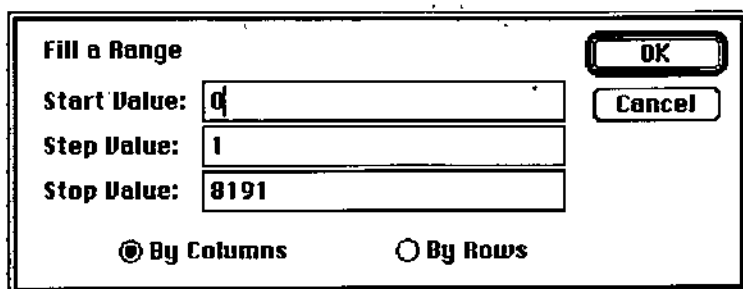


Figure 4.24: The Fill display from the Range menu.

in the first cell, then start a new column; after the eighth set of seven characters, Jazz will start a new row or record.

Click OK to establish these new settings. Then copy and paste the information desired into the worksheet. (Click Reset to return the Parse Settings box to its default options of Tab and Carriage Return.)

As a somewhat frivolous example, Figure 4.22 shows a paragraph of words converted into a column of words, which might then be sorted to produce a glossary.

**Common Range Commands** The Range commands (shown in Figure 4.23) let you work with groups of cells at a time, making worksheet work go a little easier and faster. Range commands also handle the format of the cells (such as number of decimal places displayed) and method of recalculation.

Here we'll deal with the Fill command, some Format commands, naming ranges, setting titles, and manual recalculation. In the Advanced Range Commands section that follows, we'll deal with

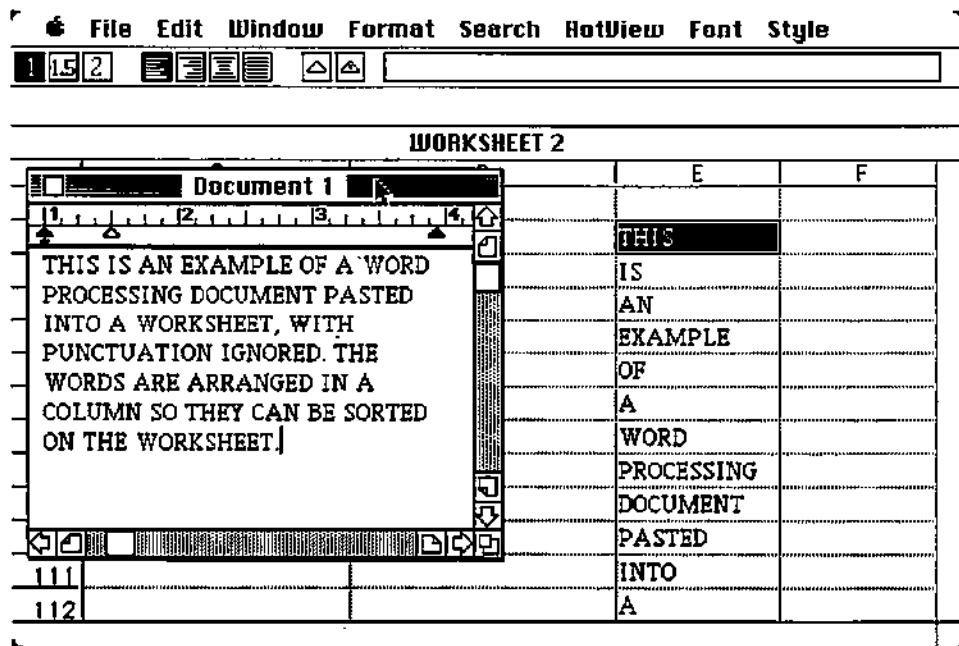


Figure 4.22: Using Parse Settings to convert a document file into a column of words.

**Parse Settings**

☒ Column Separators  
☐ Line Separators  
☐ Ignore Characters

☐ Use Column Widths

☐ Blank  
☐ Null  
☐ Carriage Return  
☐ Line Feed  
☒ Tab  
☐ Comma  
☐ Character Code: 0  
☐ Character Code: 0

OK  
Cancel  
Reset

**Figure 4.20:** The Parse Settings Display helps convert data from other documents into the worksheet or database.

Instead of specifying characters for the column separators, you can use column widths instead. When you select Use Column Widths you can define the widths of up to eight columns, as shown in Figure 4.21. If you select the default width of seven characters for eight columns, for example, Jazz will put the first seven characters

**Parse Settings**

☒ Column Separators  
☐ Line Separators  
☐ Ignore Characters

☒ Use Column Widths

| Column | Width |
|--------|-------|
| 1      | ?     |
| 2      | ?     |
| 3      | ?     |
| 4      | ?     |
| 5      | ?     |
| 6      | ?     |
| 7      | ?     |
| 8      | ?     |

OK  
Cancel  
Reset

**Figure 4.21:** Use Column Widths.



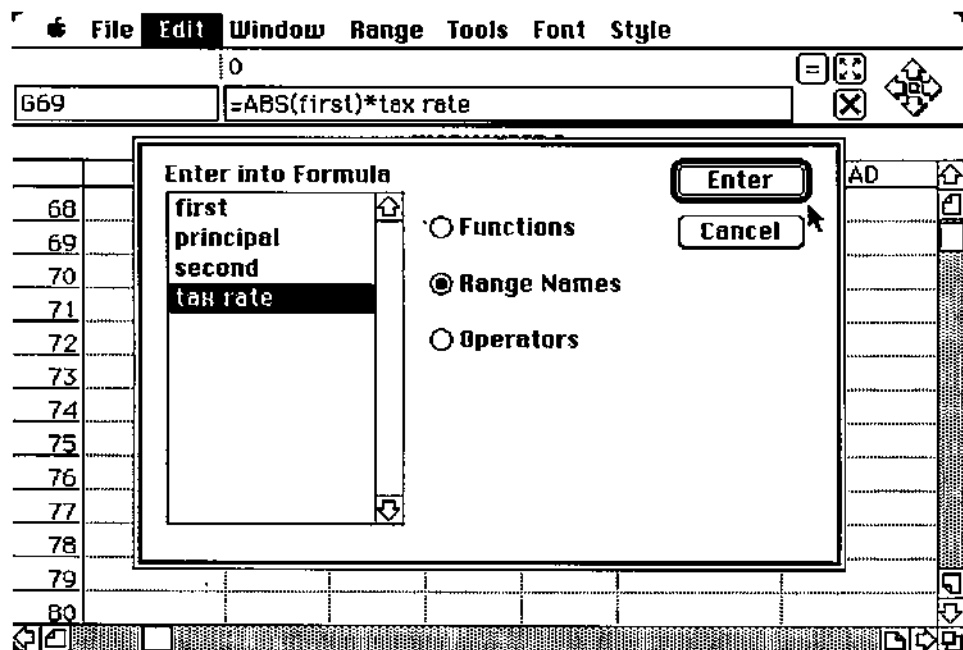


Figure 4.19: Constructing a formula with the Enter Into Formula display.

fields (columns) and records (rows). So you don't need to use Parse Settings to transfer information between these modules. Databases and worksheets both use a tab character to define a new cell and a carriage return character to define a new record or row.

But a word processor document may not look exactly like a worksheet. The columns may be separated by several spaces rather than a tab or by commas (as in a variables file). Another Macintosh program may use other special characters to show these divisions. The Parse Settings box lets you redefine the column and line separators.

To use this command, first determine how the information on the other document is laid out, then select column separators and Line Separators from the Parse Settings box, shown in Figure 4.20.

The new separators may be selected from the commonly used codes shown in the box. You can also define your own codes in the box next to Character Code (enter the ASCII decimal character code).

You can also specify any characters that you want ignored during the Paste operation by clicking Ignore Characters. These might include special characters used by the original program which aren't needed by Jazz.

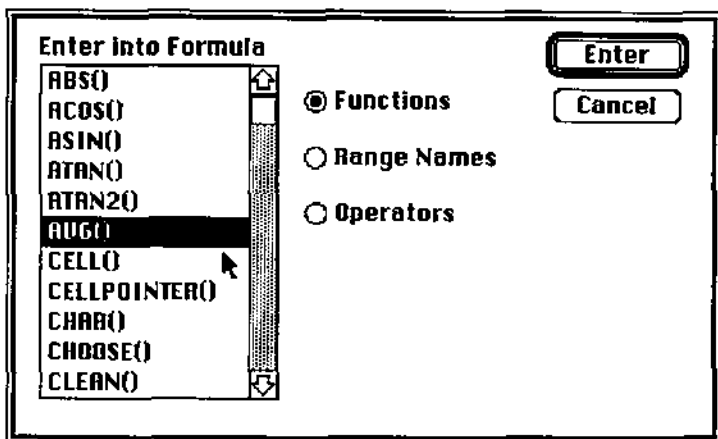


Figure 4.18: The Enter Into Formula box.

Click Operators to see the mathematical symbols from <> to #NOT#.

(If your Range Names or Operators display is blank, go back to the Functions option and move the scroll box to the very top; this should refresh the other two displays.)

Enter Into Formula is active unless you start typing text into a cell or are editing a text cell.

To construct a formula using this display, click the desired function, range name, or operator, then click Enter. The selected item appears in the entry box at the cursor position. If the selected item is a function, the argument (the part in parentheses) is highlighted, and the next character or number you type (or selection you make from the Enter Into Formula box) is put there. You can build up an entire formula this way. Figure 4.19 shows a formula constructed by selecting ABS(), then the range name **first**, which was inserted between the parentheses; the asterisk was typed, then the range name **tax rate** selected from the box, as shown.

**Parse Settings** You use the Parse Settings command on the Edit menu when you're pasting information into the worksheet from Jazz's word processing or communications module or from another Macintosh program. It helps Jazz determine how to distribute the information among the cells on the worksheet.

Moving information between the database and worksheet modules is easy because the information is already divided into cells of

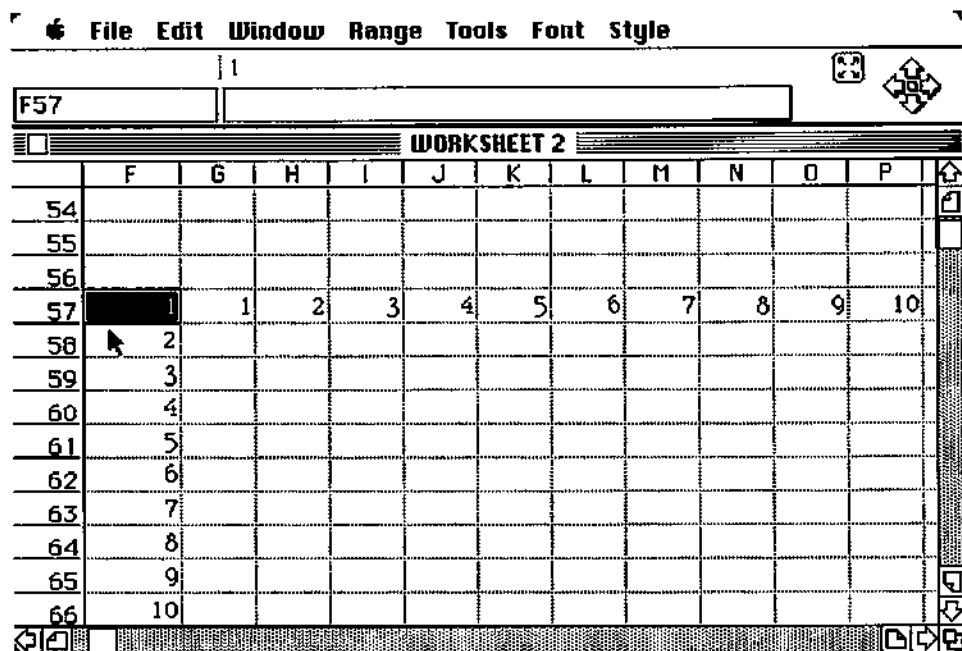


Figure 4.16: Transposing column G to row 69.

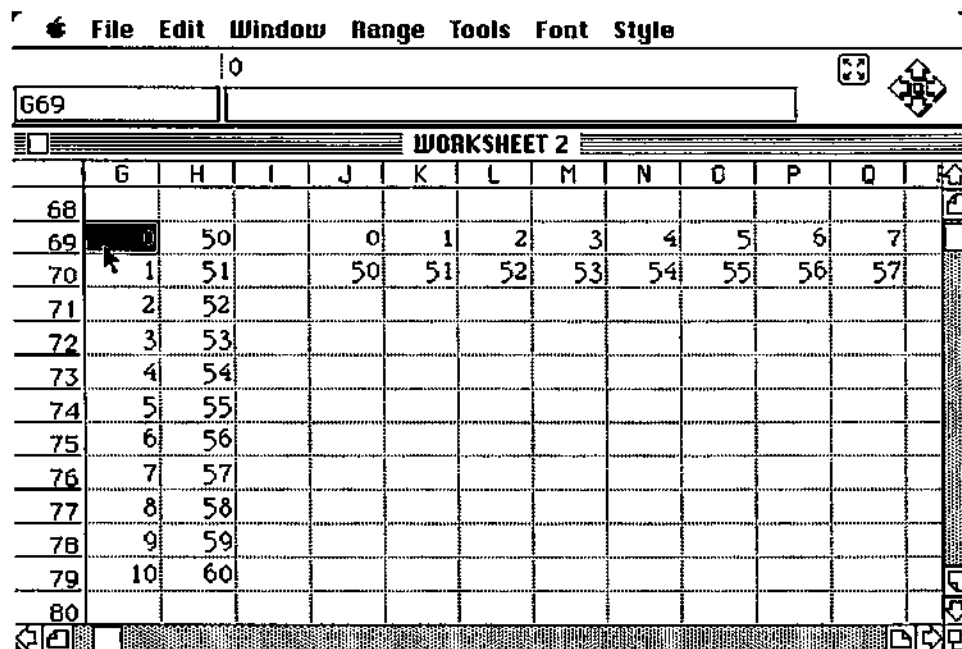


Figure 4.17: Transposing columns G and H into rows 69 and 70.

|   |        |        |          |       |               |  |
|---|--------|--------|----------|-------|---------------|--|
| File Edit Window Range Tools Font Style |        |        |          |       |               |  |
| =?                                      |        | 51     |          |       |               |  |
| E45                                     |        |        |          |       |               |  |
| WORKSHEET 2                             |        |        |          |       |               |  |
|   | A      | B      | C        | D     | E             |  |
| 43                                      | Canada | Europe | Far East | Total | Total         |  |
| 44                                      |        |        |          |       | (Less Canada) |  |
| 45                                      | 19     | 11     | 40       | 70    | 51            |  |
| 46                                      | 17     | 22     | 44       | 83    | 66            |  |
| 47                                      | 18     | 33     | 55       | 106   | 88            |  |
| 48                                      | 40     | 44     | 49       | 55    | 15            |  |
| 49                                      | 44     | 55     | 56       | 59    | 15            |  |
| 50                                      |        |        |          |       |               |  |
| 51                                      | 138    | 165    | 244      | 373   | 235           |  |
| 52                                      |        |        |          |       |               |  |
| 53                                      |        |        |          |       |               |  |
| 54                                      |        |        |          |       |               |  |
| 55                                      |        |        |          |       |               |  |

Figure 4.15: Then Subtract Values for column A from Column E.

**Transpose and Transpose Values** are valuable features that convert columns to rows and rows to columns. Formulas are adjusted accordingly. To use Transpose, select a row or column and copy it, then select the top cell of the desired column or leftmost cell of the desired row and choose Transpose. A row's contents, from left to right, will be pasted into a column, from top to bottom, as in Figure 4.16. A column's contents, from top to bottom, will be transposed to a row, from left to right. If you copy two or more rows into two or more columns, the results will be transposed correctly, as in Figure 4.17.

**Enter Into Formula** The Enter Into Formula command gives you a shortcut for entering functions and also can be used as a quick reference to the sometimes complex functions, operators, and range names constructed for your worksheet. Selecting this command gives you the dialog box shown in Figure 4.18.

Use the scroll box to move from ABS() down to YEAR(), reviewing all 90 functions available in the worksheet. Click Range Names to get a list of the range names that you've assigned for this worksheet.

File Edit Window Range Tools Font Style

E45

WORKSHEET 2

|    | A      | B      | C        | D     | E             |
|----|--------|--------|----------|-------|---------------|
| 43 | Canada | Europe | Far East | Total | Total         |
| 44 |        |        |          |       | (Less Canada) |
| 45 | 19     | 11     | 40       | 70    |               |
| 46 | 17     | 22     | 44       | 83    |               |
| 47 | 18     | 33     | 55       | 106   |               |
| 48 | 40     | 44     | 49       | 55    |               |
| 49 | 44     | 55     | 56       | 59    |               |
| 50 |        |        |          |       |               |
| 51 | 138    | 165    | 244      | 373   |               |
| 52 |        |        |          |       |               |
| 53 |        |        |          |       |               |
| 54 |        |        |          |       |               |
| 55 |        |        |          |       |               |

Figure 4.13: Use Paste Special to subtract Canada's values (column A) from the Total column.

File Edit Window Range Tools Font Style

E45

WORKSHEET 2

|    | A      | B      | C        | D     | E             |
|----|--------|--------|----------|-------|---------------|
| 43 | Canada | Europe | Far East | Total | Total         |
| 44 |        |        |          |       | (Less Canada) |
| 45 | 19     | 11     | 40       | 70    | 70            |
| 46 | 17     | 22     | 44       | 83    | 83            |
| 47 | 18     | 33     | 55       | 106   | 106           |
| 48 | 40     | 44     | 49       | 55    | 55            |
| 49 | 44     | 55     | 56       | 59    | 59            |
| 50 |        |        |          |       |               |
| 51 | 138    | 165    | 244      | 373   | 373           |
| 52 |        |        |          |       |               |
| 53 |        |        |          |       |               |
| 54 |        |        |          |       |               |
| 55 |        |        |          |       |               |

Figure 4.14: First, copy the values from column D into column E.

**Paste Special** The Paste Special command can serve as a shortcut when you're creating a worksheet. When you select Paste Special, the dialog box shown in Figure 4.12 appears.

Figure 4.13 shows a worksheet with totals for three areas (columns A, B, and C) in column D and totals for two of the areas (columns B and C) in column E. Rather than write a new formula for column E adding only columns B and C, we'll use Paste Special to subtract Canada's values from the values in the Total column.

First, copy the values from column D into column E. Select the Total column and copy it. Paste Special only works on values. So, next to protect you from overwriting a formula, the formulas in column D must be converted to values. Select E45 as the destination, call up Paste Special, and activate Paste Values. Click OK, and a copy of the values in column D are placed in column E, as shown in Figure 4.14.

Next, select and copy Canada's values in column A. Return to E45, and choose Paste Special. This time, click **Subtract Values**. When you click OK, the results should be as shown in Figure 4.15.

**Add Values** works the same way. As with Subtract Values, you can't add values to a cell with a formula.

**Overlay** is similar to Paste except that it won't overlay a blank onto a cell that already has an entry. **Overlay Values** and **Paste Values** both lay down the displayed value of any formulas in the copied range, rather than the formulas themselves. **Paste** in the Paste Special box is the same as Paste in the Edit menu.

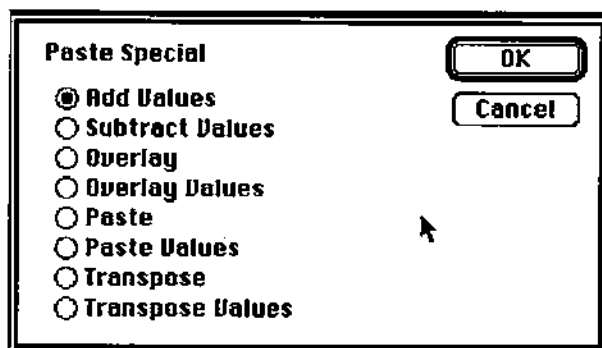


Figure 4.12: The Paste Special Display.

section later in this chapter to learn about tab settings and fields. To paste material from a word processing document into the worksheet, see the Parse Settings command in the Advanced Edit Commands section for important details on defining columns and rows in the document.

**The Insert (Row/Column) Command** The Insert command inserts a fresh row or column into the worksheet. To do this, you first select a row or a column by clicking the row number or column letter box so that the entire row or column is highlighted. An inserted row appears above the highlighted row, and an inserted column appears to the left of the highlighted column. The other columns and rows move aside to make room, and their formulas adjust to the change in location.

**Tip:** To insert several rows or columns, highlight the desired location, then use the keyboard command Command-I as many times as desired.

**The Open Cell (Edit) Command** The Open Cell command lets you edit the active cell, which is the highlighted cell. If several cells are highlighted, the active cell is the highlighted cell with the box around it. Open Cell copies the contents of the cell into the entry box. The other way to edit a cell is to double-click the cell. To edit the entry, use the mouse to position the text cursor, then type or backspace to delete. Press Return, Enter, or click another cell to finish the edit. Click the cancel box (the X that appears in a box in the upper right corner of the screen when you edit or enter data into a cell).

**Select All** To highlight the entire worksheet, use the Select All command or the keyboard shortcut, Command-A. This highlights all the cells with entries in them, as well as all the blank cells caught within the rectangular area defined by the cells with entries. This command is convenient for copying the entire worksheet contents to another file.

**Advanced Edit Commands** The advanced commands on the Edit menu include Paste Special, Enter Into Formula, and Parse Settings.

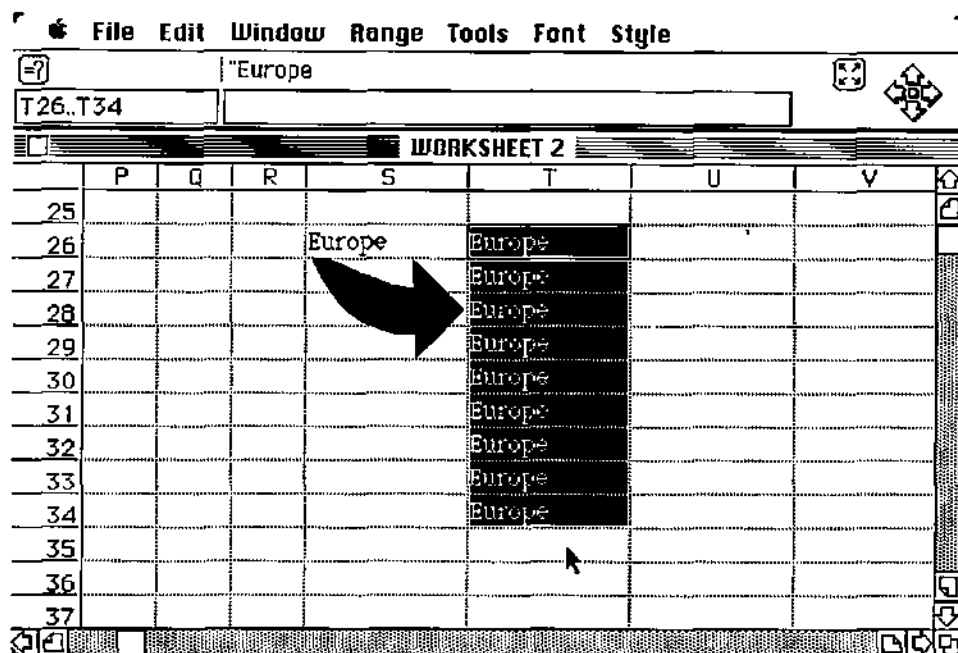
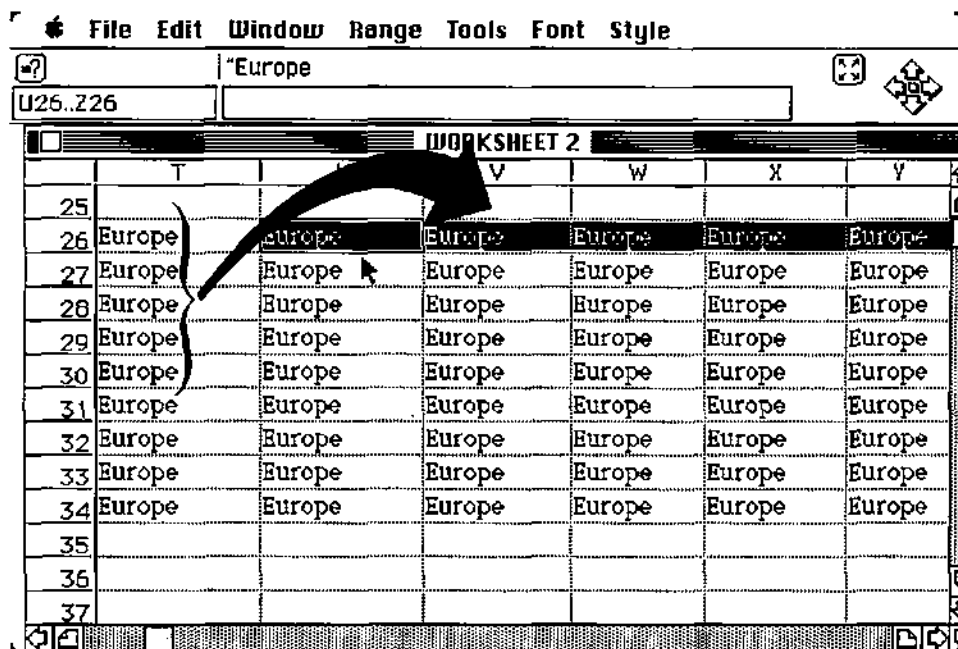


Figure 4.10: Copying one to many.



Insert Figure 4.11: A block of entries.



true: if you copy the entire column, you can't paste to a single cell because the material would need an entire column.

When selecting a range to Paste, you can select just one cell. Everything will then be pasted down so the selected cell is the top left cell in the copy (see Figure 4.9).

If you select a range rather than a single cell, the new range must be large enough to accommodate the entire old range being copied; otherwise you'll get an error message and have to try again. If you select a new range that is larger than the material being pasted, you'll get as many **complete** copies as can fit into the new range. (This is a way to copy the same number down an entire column.) See Figure 4.10.

If you copy or cut from a single row and paste to a single column, or vice-versa, you'll create a square block of entries, as shown in Figure 4.11. (To copy a row into a column or vice-versa, see Paste Special in the Advanced Edit Commands section.)

**Note:** To paste material from a worksheet to a word processor or database document, see the Working with Other Jazz Modules

| ANALYSIS 85 |        |         |             |         |
|-------------|--------|---------|-------------|---------|
|             | A      | B       | C           | D       |
| 4           |        |         |             |         |
| 5           | Abrams | William | 281-45-1198 | Europe  |
| 6           | Adams  | Samuel  | 689-75-1730 | Pacific |

| WORKSHEET 2 |          |           |             |         |
|-------------|----------|-----------|-------------|---------|
|             | A        | B         | C           | D       |
| 1           | Abrams   | William   | 281-45-1198 | Europe  |
| 2           | Adams    | Samuel    | 689-75-1730 | Pacific |
| 3           | Akins    | James     | 582-81-2780 | East    |
| 4           | Allen    | Thomas    | 293-31-0209 | West    |
| 5           | Almassa  | Robert    | 577-10-9647 | Europe  |
| 6           | Alpers   | Nancy     | 452-67-3050 | West    |
| 7           | Caffrey  | Paula     | 594-01-9252 | Central |
| 8           | Callahan | MaryEllen | 925-66-3813 | West    |
| 9           | Castle   | Robert    | 927-01-5595 | Central |

Figure 4.9: The range in Analysis 85 is copied into Worksheet 2 starting at cell A20.



Figure 4.7: When you can't Undo.

too, even though blank, and the Clipboard will indeed be overwritten by the blank cells.

Be aware that there's a limit to how much you can cut or copy at a time, depending on how many documents you have open at the moment and how large they are. If you lack memory for an operation, select a smaller area or close some documents to make room.

There are a few things you should know about using the Paste command. If the Paste option is dimmed on the Edit menu, that means that the current selected range is inappropriate for the material in the Clipboard. For example, if a range of three cells is copied, selecting the entire column by clicking the column letter at the top of the worksheet will cause Paste to be dimmed. The reverse is also

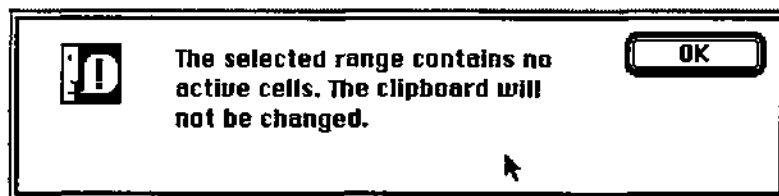


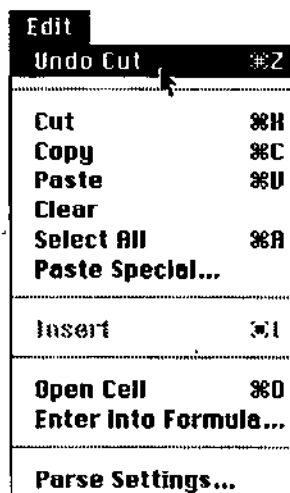
Figure 4.8: Message when copying from non-active cell.

The Undo command, shown in Figure 4.6, can be quite useful when you're cutting, copying, and clearing material from the worksheet. To **cancel** a Cut, Copy, or Clear command, first look at the Edit menu. Undo Cut, Undo Copy, or Undo Clear appears at the top, depending on which you last did. Select it to cancel the last operation and replace the cut or cleared material. Undo Entry will cancel the last thing you typed or edited in a cell.

If you undo a cut or copy, whatever had been on the Clipboard previously is replaced; however, if you view the Clipboard, the Undo command is cancelled (see Figure 4.7) and you can no longer undo that cut, copy, or clear (even though Clear doesn't affect the Clipboard).

The Clear command doesn't put things in the Clipboard, so if you need to delete something without affecting the contents of the Clipboard, use Clear rather than Cut.

You'll usually use these commands within the active part of your worksheet. If you try to cut or copy from a cell or range outside the active area of the worksheet, you'll get the error message shown in Figure 4.8. All it means is that the Clipboard won't be erased by copying a blank cell into it. This commonly happens when you mean to paste something into a new range and use Copy by mistake, so it's a handy safety device. Unfortunately, if the blank range is within the active part of the worksheet, then it's considered active



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Figure 4.6: The Undo Command.

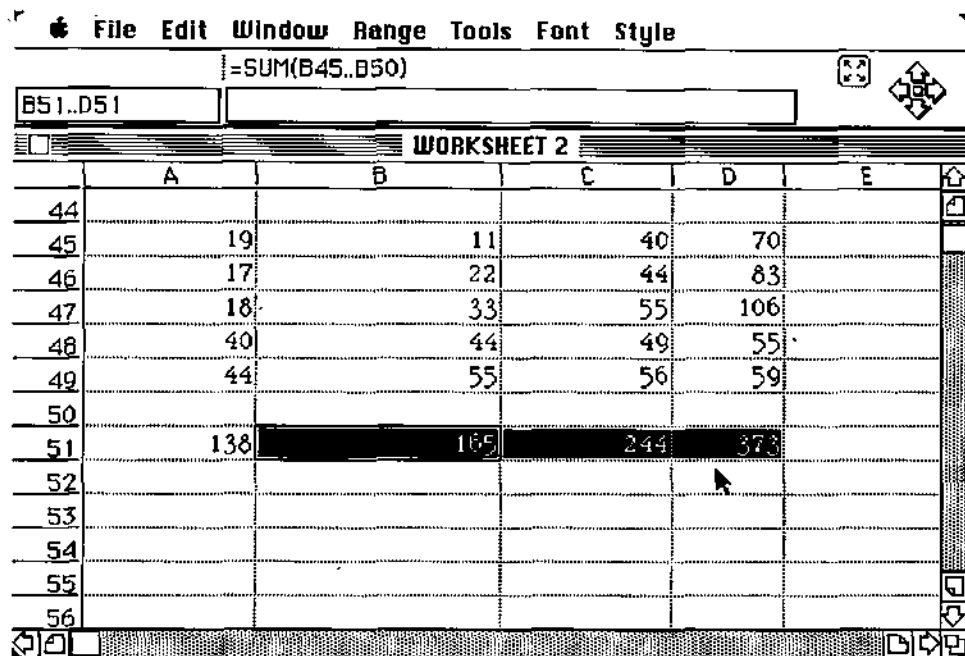


Figure 4.4: Copying a formula.

location. (To prevent them from adjusting, see Absolute Reference in the Advanced Edit Commands section.)

You can use cut to **delete an entire row or column**. Click the column letter at the top of the worksheet or the row number at the left. The entire column or row is highlighted including the row number or column letter, as shown in Figure 4.5. If you cut, the material below or to the right is shifted up or over to fill in, and the formulas in the moving cells are adjusted. If you only want to delete the **contents** of the row or column, use Clear or select the specific range rather than the entire row or column.

|    |         |        |             |        |  |
|----|---------|--------|-------------|--------|--|
| 27 | Akins   | James  | 582-81-2780 | East   |  |
| 28 | Allen   | Thomas | 393-31-0209 | West   |  |
| 29 | Aimassa | Robert | 577-10-9647 | Europe |  |
| 30 | Alpers  | Nancy  | 452-67-3050 | West   |  |

Figure 4.5: Selecting an entire row.

|             |             |          |             |             |             |
|-------------|-------------|----------|-------------|-------------|-------------|
| WORKSHEET 2 |             |          |             |             |             |
|             | A           | B        | C           | D           | E           |
| 13          | Monaldez    | Frank    | 167-30-0865 | Central     | Leonard     |
| 14          | ANALYSIS B5 |          |             |             |             |
| 15          |             | A        | B           | C           | D           |
| 16          | 37          | Maggiore | Leonard     | 542-75-5193 | Europe      |
| 17          | 38          | Marques  | George      | 343-26-4819 | Central     |
| 18          | 39          | Martin   | Vera        | 255-31-6051 | Central     |
| 19          | 40          | Minh     | Lee         | 457-49-0844 | Pacific     |
| 20          | Clipboard   |          |             |             |             |
| 21          |             | A        | B           | C           | D           |
| 22          | 1           | Maggiore | Leonard     | 542-75-5... | Europe      |
| 23          | 2           | Marques  | George      | 343-26-4... | Central     |
| 24          | 3           | Martin   | Vera        | 255-31-6... | Central     |
| 25          | 4           | Minh     | Lee         | 457-49-0... | Pacific     |
| 25          | Ab          | 26       | Kucine      | Juan        | 733-32-2788 |

Figure 4.3: The Clipboard holds Cut and Copied data.

You will find the Cut, Copy, Paste, and Clear commands very useful. Copy and Paste are convenient for **extending a row of calculations** without having to repeat the calculation laboriously in each cell. For example, we need to add up the numbers in columns A, B, C, and D. The formula, simple enough, is

**=SUM(A45 . . A49)**

for column A. Change the A to B for column B, and so on. Rather than type the same formula for each column, highlight cell A51 and use the Copy command to copy it. Then highlight B51 through D51, and select the Paste command. The result is shown in Figure 4.4. Notice that the program has automatically adjusted the formula so that in cell B51 the formula reads:

**=SUM(B45 . . B49)**

In C51, the Bs are changed to Cs, and in D51 the Cs are changed to Ds. This is called automatic adjustment, and Jazz automatically adjusts formulas any time the cells move or are copied to another

the Edit menu. The data are copied from the Clipboard to the new range.

- To **delete** the range without affecting the Clipboard, use the Clear command.

We'll use the Copy and Paste commands to put some data on our worksheet by copying them from the sample worksheet created at the beginning of this chapter. Open the worksheet Analysis 85 and select a block of data. Select Copy from the Edit menu (see Figure 4.2).

The material is now in the Clipboard. To see it, select Clipboard from the Window menu, shown in Figure 4.3. Close the Clipboard when you're done.

Click the practice worksheet and select cell A4 as the destination. Select Paste from the Edit menu. The selected material appears on the worksheet. (The selected material is still on the Clipboard as well, so it could be copied to several other worksheets or other areas on the same worksheet.)

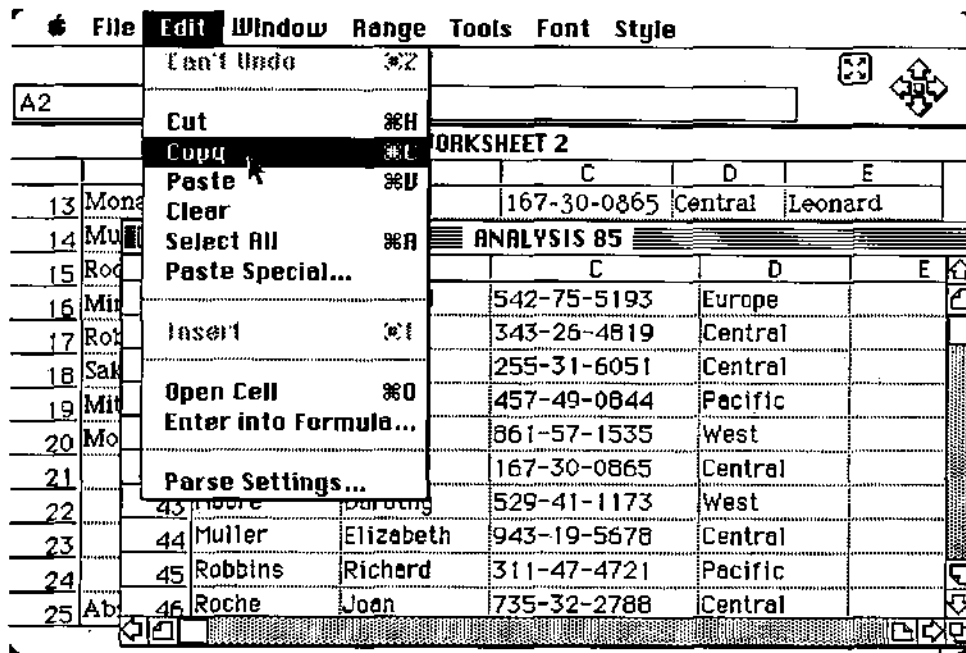


Figure 4.2: Select Copy to copy the defined range.

**Cut, Copy, Paste, and Clear; Undo** These five commands are often used together. Cut removes material from the worksheet. Copy makes a copy of the material. In both cases, the material cut or copied is put in a temporary part of your computer's memory called the Clipboard (where it can be examined if you forget what you last cut or copied). Paste lets you put what you previously cut or copied elsewhere on the worksheet or in another document. Clear deletes information without affecting the Clipboard. Undo cancels the previous command.

The basic procedure for using the Cut, Copy, Paste, and Clear commands is:

- Select the range.
- To **move** the range, select Cut from the Edit menu, shown in Figure 4.1. The range is cut (deleted) and copied into the Clipboard. Move the cursor to a new location, select a new range, and select Paste from the Edit menu. The data is copied from the Clipboard to the new range. (When you use either Cut or Copy, the copy remains in the Clipboard until overwritten by a new Cut or Copy operation.)
- To make a **copy** of the range, select Copy from the Edit menu. A copy of the range is put into the Clipboard. Move the cursor to a new location, select a new range, and select Paste from

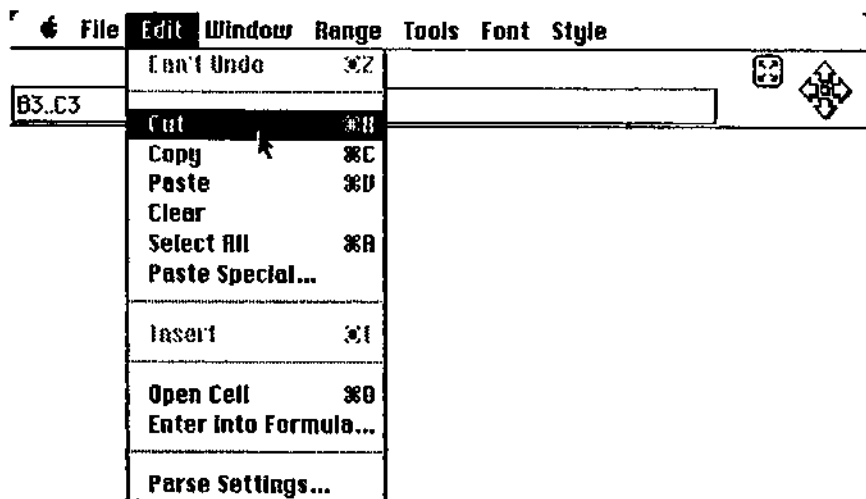


Figure 4.1: Pull-down menu sample.

The remainder of this chapter explains the worksheet operation by functions:

- The pull-down menu commands
- Formulas and functions
- Saving, loading, and printing the worksheet
- Working with other modules of Jazz.

Each group of functions is divided into common operations you'll use on a daily basis and advanced operations for expert use. (You will also find a list of operations and menus for all Jazz modules, with one-line descriptions for quick reference, in Appendix A, *Jazz at a Glance*.)

**The Pull-Down Menu Commands** The pull-down menus that occupy the menu bar across the top of the Jazz worksheet offer quick access to the commands needed to edit the worksheet, move among windows, manipulate ranges of information, change formats, sort, and perform other functions. As always with the Macintosh, select the operation from the appropriate pull-down menu using the mouse. Note, too, that the exact selections available in the pull-down menus change according to what you're doing on the worksheet.

The menus are labeled File, Edit, Window, Range, Tools, Font and Style. We'll review the commonly used commands in each menu first.

• **File Edit Window Range Tools Font Style**

To follow the discussion, start Jazz and create a new worksheet document from the Jazz file display.

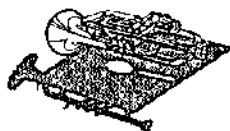
**Common Edit Commands** The Edit menu is used to edit a cell, copy material between documents or within a document, insert extra columns and rows, and undo a previous command. Paste Special and Parse Settings are discussed in the next section, *Advanced Edit Commands*.



and select Copy from the Edit menu. Then we switch windows to the database.

Here a field, Performance Index, is added to the database in a few keystrokes by selecting Add Field from the database Edit menu. We set up the Percent format using the Field Format command in the same menu. The field is now ready to receive our index figures, so we choose Paste from the database Edit menu and see our numbers appear (Figure 4R.4).

The first part of our Jazz worksheet mission in preparing an executive presentation has been accomplished, and in only minutes!



Now, rather than repeatedly type this same formula in each cell in column G, varying the formula only by the row number, we use the Jazz Copy and Paste commands to do the work for us. First, we highlight cell G6 and choose Copy from the Edit menu. Then, we highlight the rest of the cells from G7 down to the end of the sales list (cell G55 in this case) and select Paste from the Edit menu.

Jazz copies the formula into each cell in the highlighted range, automatically adjusting the formula so that each cell refers to the correct row number. Jazz calculates the results, and in an instant, we have generated a performance index, as shown in Figure 4R.3.

Now we need only select the Percent format for column G from the Format command in the Range menu, and we're ready to send the performance index back to the Sales Staff database.

Since the order of the names is the same on the worksheet as in the database, we need only highlight the performance index figures

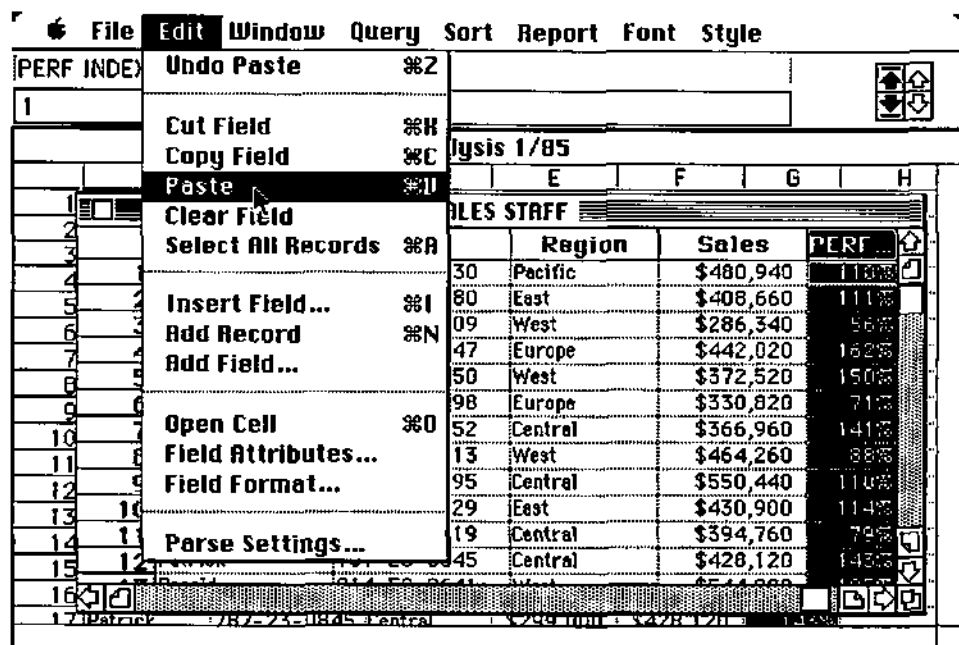


Figure 4R.4: The results are copied from the worksheet and pasted into the newly created Performance Index field of the Sales Staff database. Mission accomplished!

easier to read. First, we format the two columns containing dollar figures. Highlighting the numbers in columns E and F, we select Format from the Range menu. (However, we do this by dragging the cursor through the number cells; we don't highlight the entire columns by clicking the column titles because this would format every cell down to row 8191 and give the worksheet an unwieldy 50,000 empty cells.)

Next, we insert a blank row to separate the column names from the numbers to make it more readable.

Now we can generate the performance index shown in Figure 4R.3. The formula is simply the actual sales divided by the target, yielding a percentage of goal achieved. In the first cell, G6, we enter the formula =F6/E6, and press Return. Jazz instantly calculates the result, 1.17676. The first salesperson made 118 percent of his goal (we'll convert to the proper format in a moment).

|   |  |                     |               |  |  |  |
|---|--|---------------------|---------------|--|--|--|
| File Edit Window Range Tools Font Style |  |                     |               |  |  |  |
| Undo Paste                              |  | %Z                  |               |  |  |  |
| Cut                                     |  | %H                  |               |  |  |  |
| Copy                                    |  | %C                  | Analysis 1/85 |  |  |  |
| Paste                                   |  | %V                  |               |  |  |  |
| Clear                                   |  |                     |               |  |  |  |
| Select All                              |  | %A                  |               |  |  |  |
| Paste Special...                        |  |                     |               |  |  |  |
| Insert                                  |  | %I                  |               |  |  |  |
| Open Cell                               |  | %O                  |               |  |  |  |
| Enter into Formula...                   |  |                     |               |  |  |  |
| Parse Settings...                       |  |                     |               |  |  |  |
| G7..G20                                 |  |                     |               |  |  |  |
| 1 - 1st                                 |  |                     |               |  |  |  |
| 2                                       |  |                     |               |  |  |  |
| 3                                       |  |                     |               |  |  |  |
| 4 FNAM                                  |  |                     |               |  |  |  |
| 5                                       |  |                     |               |  |  |  |
| 6 Samuel                                |  |                     |               |  |  |  |
| 7 James                                 |  |                     |               |  |  |  |
| 8 Thomas                                |  |                     |               |  |  |  |
| 9 Robert                                |  |                     |               |  |  |  |
| 10 Nancy                                |  |                     |               |  |  |  |
| 11 Willie                               |  |                     |               |  |  |  |
| 12 Paula                                |  |                     |               |  |  |  |
| 13 MaryEllen                            |  | 925-66-3813 West    |               |  |  |  |
| 14 Robert                               |  | 927-01-5595 Central |               |  |  |  |
| 15 Eleanor                              |  | 770-46-5329 East    |               |  |  |  |
| 16 Elizabeth                            |  | 793-64-2819 Central |               |  |  |  |
| 17 Patrick                              |  | 787-23-0845 Central |               |  |  |  |

Figure 4R.3: The formula in cell G6 is copied down column G in an instant, automatically adjusting to the changing row numbers.

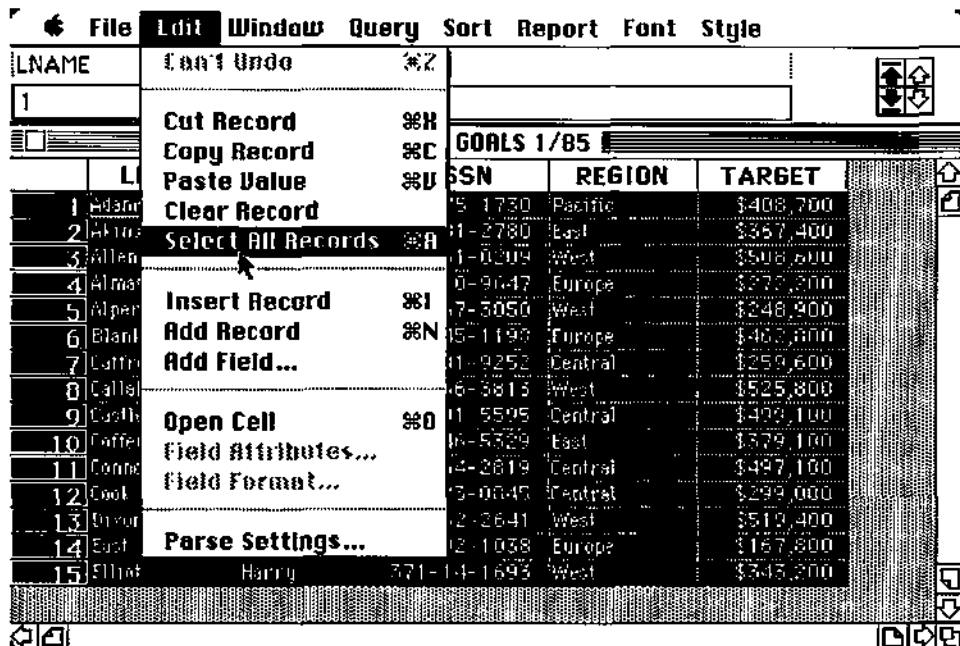


Figure 4R.1: Select All Records from the Staff Goals database, then Copy Record.

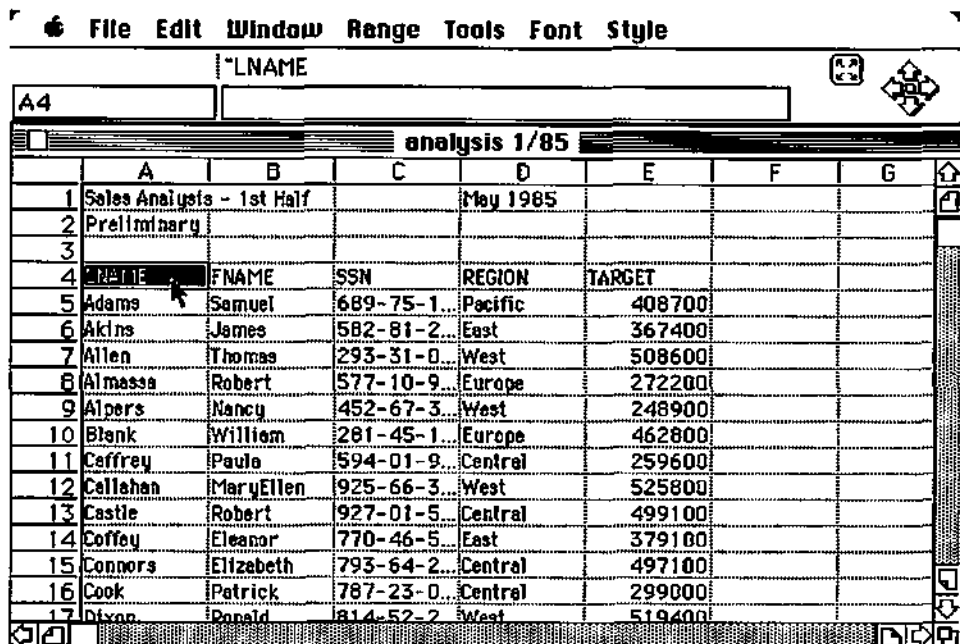


Figure 4R.2: The first database is copied to the worksheet.

## CREATING THE SAMPLE PAGE

To prepare the executive presentation, the Jazz worksheet will be used to determine the sales performance of the sales staff and will provide the numerical analysis on which the graphs are based. For this introduction to the Jazz worksheet module, we'll walk through the calculation of the performance index for the WidgeCo sales staff.

Two databases contain information needed to determine sales performance. The first database contains the actual sales achieved by the staff in this half, and the second one has the sales goals for each salesperson. The performance index compares actual sales with sales goals to see if the staff met their goals for this period.

To begin, use New from the File menu to create and display a new blank worksheet. Prepare the worksheet by inserting headings giving the title and date of the worksheet.

**Copying Information from the Databases** Select Open from the File menu and choose the first database, Staff Goals, from the list. To ensure that the two databases will match, use the Sort menu to sort the records in alphabetical order by last name. Then choose Select All Records from the Edit menu, as shown in Figure 4R.1.

Switch to the worksheet, click cell A4, and select Paste from the Edit menu. A copy of the entire sorted database, including field names, is pasted to the worksheet (Figure 4R.2).

We now switch to the second database, Sales Staff, which contains the current sales figures that we want to compare with the goals (the target sales figures). Again, we sort this database so that it will be in the same order, then switch to the first database to double-check that the resulting list has no missing or extra names. Having confirmed that the two lists are in the same order, we need only copy the Sales field. We select that field, choose Copy Values from the Edit menu, switch windows to the worksheet, activate cell F4, and Paste the actual sales figures, including the field name, into the worksheet in column F.

We now have the material necessary to perform the main analysis, but before proceeding, we'll organize the worksheet to make it

## **K** KEY TO THE SAMPLE PAGE

The document on the facing page is from the executive report in Chapter 8. It uses material prepared by the worksheet module of Jazz, which was copied from the worksheet into a word processing file and then modified for the report.

- (A) This table was brought into the document from the worksheet in a few seconds using the Copy and Paste commands. Tables no longer need to be re-entered and proofread by statistical typists.
- (B) The worksheet module quickly and accurately sorted the entries before sending it to the report.
- (C) Results of calculations performed in the worksheet can be displayed right in the middle of report text, rather than on separate pages or in appendices at the end of the report.
- (D) The emphasized key areas of the table, the word processor's commands, were used to change the style of the column labels and boldface the numerical results so important elements can be picked out at a glance. The entire table was set in a different font to set it apart from the rest of the page.
- (E) The second table was brought in from the worksheet using the HotView feature. Though the table is now in the word processing file, it remains connected to the worksheet so that any last-minute changes to the worksheet are instantly reflected in the executive presentation. Final reports truly reflect the latest data available.

# EXECUTIVE REPORT

## SPREADSHEET SAMPLE PAGE

WIDGECO INC.

Sales Performance Report

### SALES STAFF PERFORMANCE

(A) Performance by the WidgeCo sales staff in the preceding fiscal year was up over last year and on the average exceeded sales goals. Of the company's 50 sales people, 31 reached or exceeded their sales goals for the year. Twelve exceeded goals by 25% or more. This success is clearly due to policies put in place by the sales department and executive committee, especially since goals were raised over last year's targets.

By tradition, WidgeCo gives a plaque to each region's top performing salesperson. Because of the superior performance this year, the president will for the 25th Anniversary Sales Conference hand out bronzed widgets on oak bases to the top two performers in each region, and a special prize to the top two overall performers, noted below:

|       |          |                 | Sales     | Performance |
|-------|----------|-----------------|-----------|-------------|
| (B) { | Central: | Franklin Julius | \$333,600 | 139%        |
|       |          | Cook Patrick    | \$428,120 | 118%        |
|       | East:    | Geraldi Anthony | \$369,740 | 117%        |
|       |          | Sanders Allen   | \$330,820 | 116%        |
|       | Europe:  | Vaughan William | \$330,820 | 136%        |
|       |          | East Deborah    | \$250,200 | 109%        |
|       | Pacific: | Minh Lee        | \$486,500 | 121%        |
|       |          | Goode Eugene    | \$380,860 | 105%        |
|       | West:    | Whitman Mary    | \$255,760 | 134%        |
|       |          | Elliot Harry    | \$222,400 | 112%        |

### REGIONAL ANALYSIS

The following chart shows sales by region and average of sales goals for the regions and for the company as a whole.

|          | Total Sales | Average Performance |
|----------|-------------|---------------------|
| (E) East | \$4,067,140 | 102%                |
| West     | \$4,620,360 | 103%                |
| Central  | \$5,334,820 | 104%                |
| Europe   | \$2,290,720 | 106%                |
| Pacific  | \$3,021,860 | 100%                |

July 1985

4

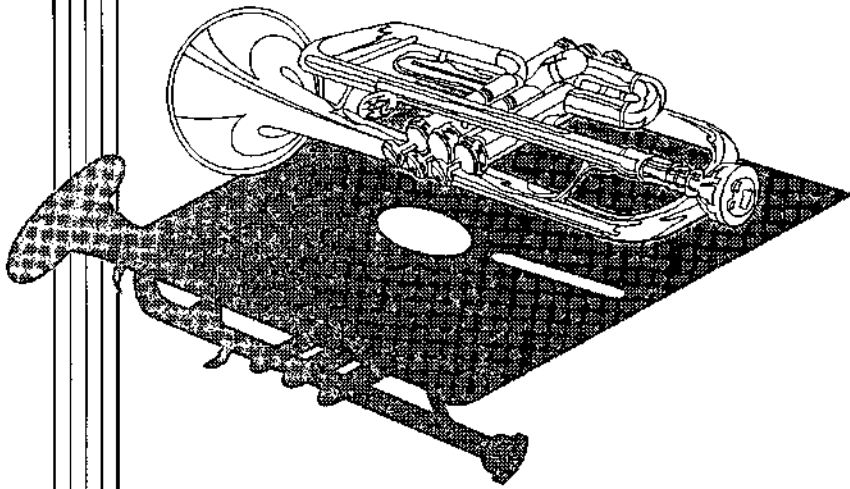
# 4

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**I****NTRODUCTION** The Jazz worksheet makes it easy to manipulate columns of numbers. The numbers can be entered directly, or they can be imported from the database, communications, and word processing modules. A full range of worksheet functions lets you perform calculations easily and automatically. The results of your worksheet can be sent to the other modules, and the HotView feature makes it possible to send a temporary worksheet which will be updated automatically as numbers on the worksheet change.

For our WidgeCo executive report, the worksheet uses basic data from the data base to make the calculations necessary to determine the top performers at WidgeCo. Baseline numbers are returned to the database so an employee performance report can be generated. Performance data form the basis for graphic displays, and summary portions of the worksheet are included in the final executive report.





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# ***WORKSHEET***



## **K** **EY TO THE SAMPLE PAGE**

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The chart on the facing page is from the executive report in Chapter 8. This chart was prepared by the graphics module of Jazz from selected data in a Jazz worksheet. Then it was copied into the word processing file.

- Ⓐ Although the chart is in the word processing file, it is still connected to the worksheet, so if the worksheet numbers are updated, the chart will immediately change to reflect the new results. Final reports show the very latest data available—you no longer need to account for production delays.
- Ⓑ Because of the Macintosh's graphics abilities, this chart can be included on the same page as the text, rather than on a separate page or in an appendix. The chart can be reproduced in any size desired.
- Ⓒ The patterns used to identify areas in the chart can be altered to suit your requirements.
- Ⓓ Labels can be added anywhere in the chart.
- Ⓔ Labels can be emphasized by using any of Jazz's type fonts and styles, so important labels can be highlighted.

## **C**REATING THE SAMPLE PAGE

To prepare the WidgeCo executive report, the Jazz graphics module will be used to create displays of key data, which are then inserted in the report using the HotView feature of the word processor. For this introduction to graphics, we'll walk through the creation and labeling of a pie chart showing sales by WidgeCo region.

**P***reparing the Worksheet* To begin, use Open from the File menu to display the Analysis 1/85 worksheet, which contains data analyzing sales performance at WidgeCo. These data include the names of the WidgeCo salespeople, along with their regional office, individual sales, sales goal, and percent of goal achieved. For this analysis of regional performance, we need to summarize regional sales.

First, we use the Sort command on the Tools menu to sort the worksheet by region, so the salespeople will be organized in regional groupings to make summarizing easier.

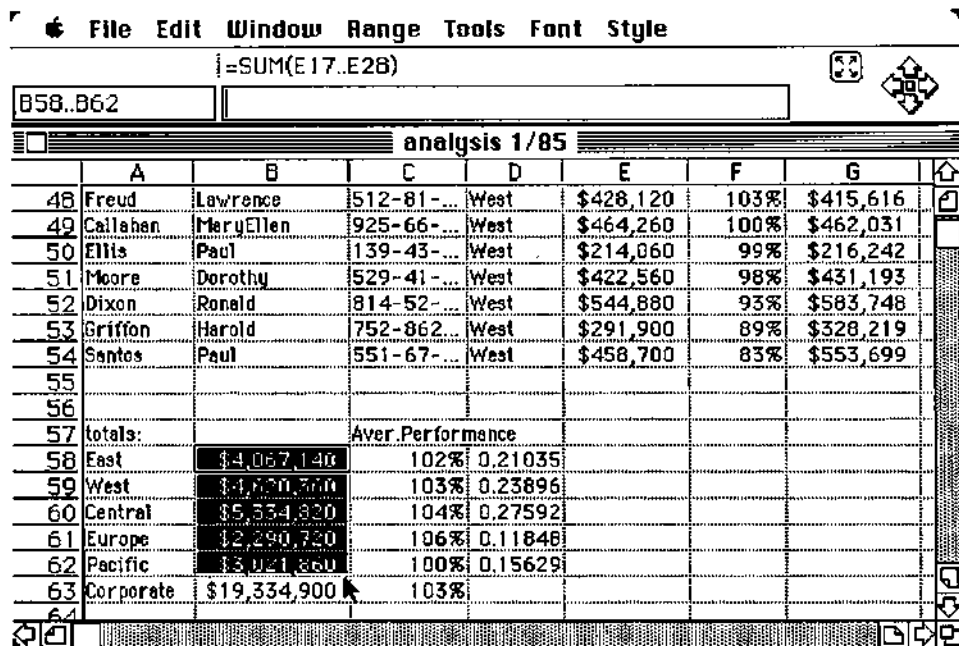
Then, in an open area at row 57 of the worksheet, we set up the formulas to add up sales in each region. Figure 5R.1 shows the regions, the regional sales totals (column B), averages of the region performance indexes (column C), and each region's percentage of total corporate sales (column D).

Sales totals are determined by adding up individual sales in each region. These figures are summed for total corporate revenues, and then they are divided by that total to determine the percentage of sales for each region in column D.

Now that we have prepared the regional totals, we are ready to create a pie chart to display graphically the relationship among the five sales regions. To do this, we first highlight the area that will be graphed: cells B58 . . . B62, which contain the sales figures for the regions.

Next we open a Graphics window by selecting New from the File menu, then Graphics to create a graphics document.

A blank Graphics window appears, with a typical x-y axis layout. Since this will be a pie chart, we choose Pie from the Type menu. The axis is replaced by a blank circle awaiting data. Selecting data to be graphed simply requires highlighting cells on the worksheet,



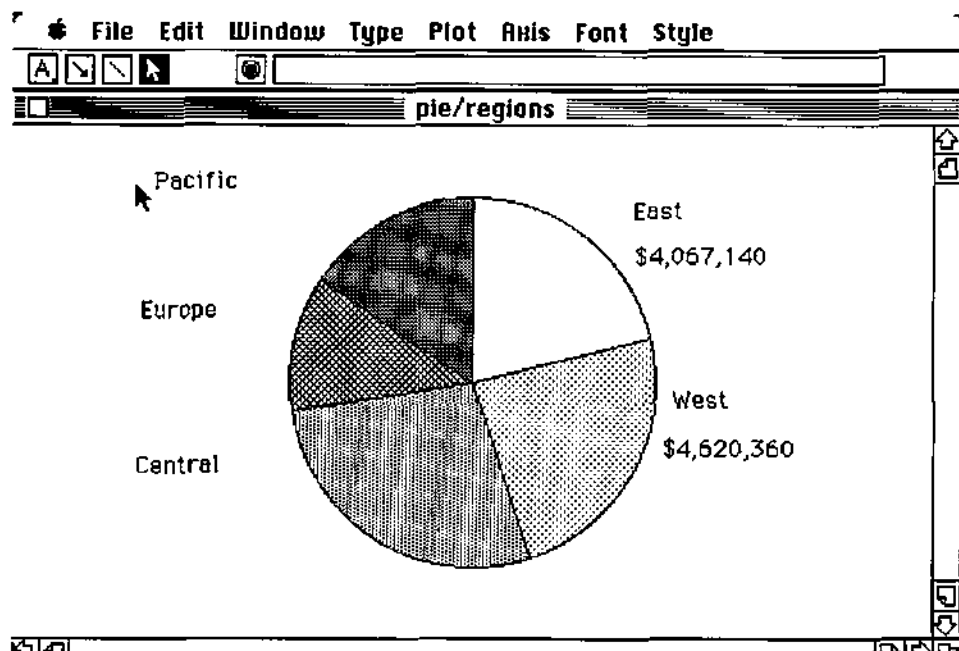
**Figure 5R.1:** In the worksheet, we add up sales for each region (column B) and determine each region's percent of total corporate sales (column D).

which we've already done. We proceed to the Plot menu and choose Pie, the only option available.

The data are graphed on the pie chart, starting with the first cell at the twelve o'clock position and proceeding clockwise. The different patterns distinguish the data areas (see Figure 5R.2).

Next, we'll label the patterns by typing the region names. We use the cursor to select the boxed A in the upper left corner of the screen, which is the notation well. When we move the cursor to the graph sheet, it takes on a cross-hair shape. We select an area near the first quadrant of the pie chart in the upper right, hold down the mouse button, and drag open a box. When we release the button, we see a box appear next to the first area of the chart.

We can now type the name of the first region, East, on the worksheet. We proceed clockwise to label each of the five areas of the pie chart. We dip our cursor in the notation well for each entry, drag open a box, and type in a region label. We add the exact dollar amount for sales in each region in a similar fashion. Next, we type in a label for the entire chart at the bottom.

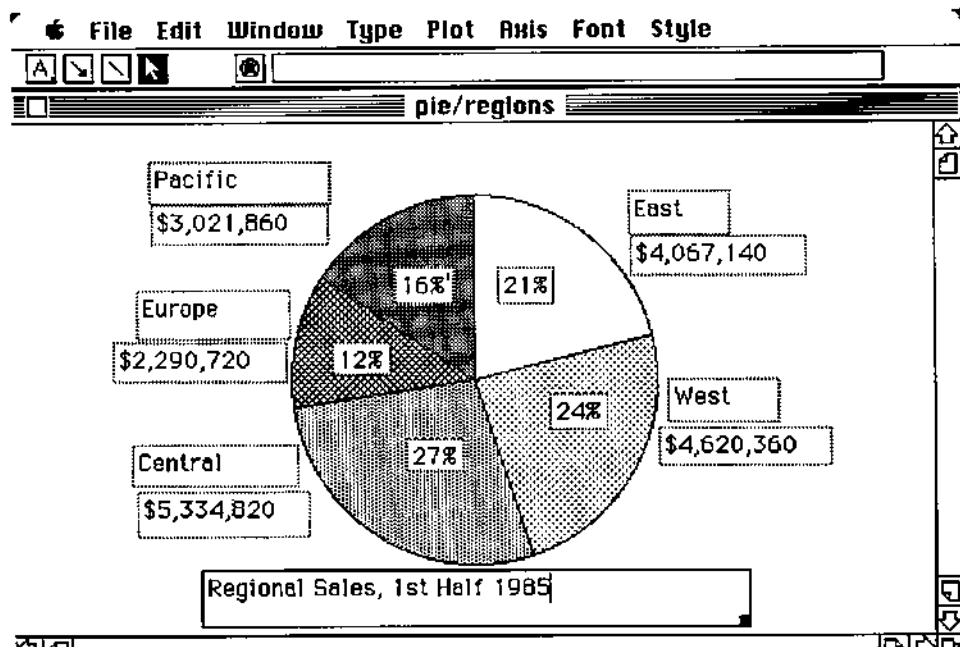


**Figure 5R.2:** A pie chart showing regional contributions to total profits is drawn automatically. Labels are entered by typing, and they may be dragged around the area.

Because the sales figures are so closely related, we wish to clarify the exact percentage that each region contributed to the corporate sales total. We add boxes inside the pie chart and type in the percentages. Notice in Figure 5R.3 that Jazz clears a space in the chart pattern for the labels to appear.

Figure 5R.3 also shows the notation boxes in which the entries are made. These become invisible when you're done labeling. You can see the cursor, in the form of a line, within the chart title box, which is active at the moment. The tiny dark square in the bottom right corner of the notation box lets you drag the box to make it larger or smaller to fit the label. The entire box can be dragged into any position that you desire.

Now that we've labeled the chart and checked our spelling, it's time to consider adding some of the stylistic flourishes for which the Macintosh is famous. We activate one of the label boxes and selecting the Font menu, then choose 18-point type size for each of our regional labels, dollar figures, and percentages and 24-point type for



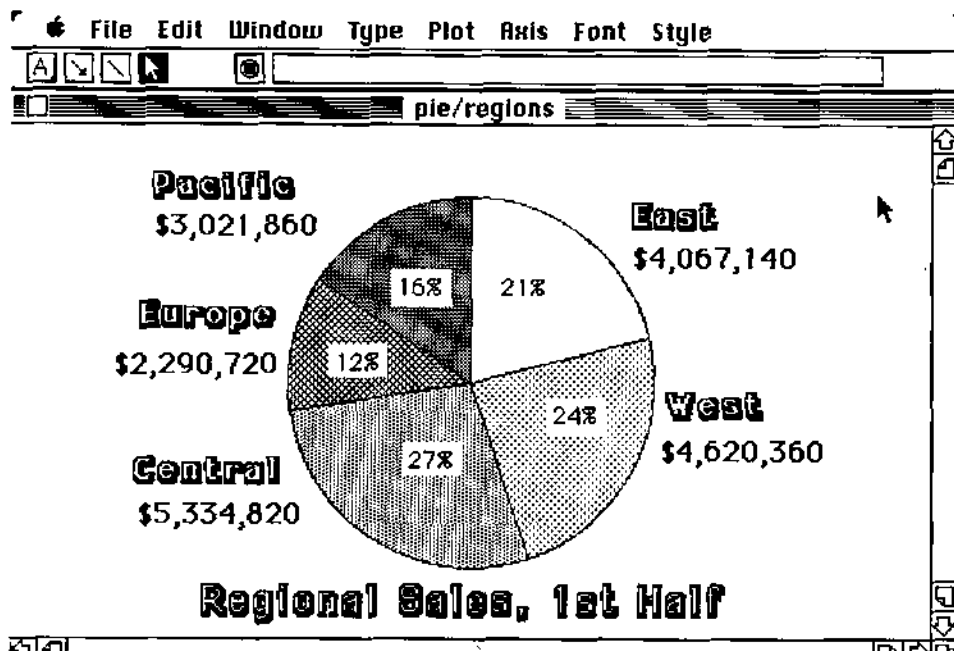
**Figure 5R.3:** Notation boxes are where labels are typed; they can even be typed within the figure.

the title. Next, we select Shadow from the Style menu and emphasize the region names and figure title with that style. Finally, we bold-face the dollar figures. The result is a chart similar to the one displayed as Figure 5R.4.

We are now ready to insert the figure into our word processor document. We select Open from the File menu and choose the draft of the executive report. When the document is displayed, we proceed to the point where we want the figure to appear.

We next select Include on the HotView menu that appears in the word processing menu bar. Jazz checks the previously active window; since it's a Graphics window, Jazz copies the entire graph into the word processor document (if it was a database or worksheet, Jazz would copy the highlighted area).

We've copied a HotView, which means that we didn't have to wait for final data before inserting the chart. Any changes made to the chart in the Graphics window are immediately reflected in the word processor document. And since the Graphics window is in



**Figure 5R.4:** The final figure. Labels can be emphasized using the same font sizes and style changes available for the other jazz modules. Here, labels are 18 point and the title 24 point; words are in shadow style and numbers in boldface.

turn linked to the worksheet from which it draws its data, any change in the worksheet is reflected instantly in the pie chart and then in the word processor document. The active linking of documents means you only need to update your basic data, and Jazz takes care of the rest. The linked windows don't have to be open when you make the changes. Whenever they are opened, they will be updated to reflect changes made in related windows. (You can also break the link by freezing the HotView so it will no longer change, as explained in Chapter 6.)

A pie chart that demonstrates a key element of the executive report has been prepared in only minutes; yet by using a Laser-writer, we can obtain results of a quality normally expected only after elaborate preparations by professional graphics artists.





The remainder of this chapter contains an overview of the graphics module, the details of using the pull-down menus commands to create graphics, and information about working with graphics and other Jazz modules.

**An Overview: Using Graphics** The graphics module of Jazz is used to illustrate data provided by the worksheet and database modules. Creating graphics requires only a few basic steps:

- Select the data from the worksheet or database.
- Open a graphics window.
- Select the data type.
- Select the plot.

You repeat these steps for each set of data to be displayed on the same graph.

Once the graph has been plotted, many refinements are possible. You can label and write on the graph, highlight data, and draw arrows to point out special features. When you've finished creating a graph, you can save it for later use, include it in another document, or print it.

**Selecting Data from a Worksheet or a Database** To use the graphics module, first you must open a worksheet or database module and select the data to be graphed. In Figure 5.1, we've highlighted the salaries of the region's salespeople for graphing. You need only to highlight the data; it's not necessary to use the Copy or Cut commands on the Edit menu.

Next, open a Graphics window either by choosing Open from the File menu and selecting an existing graph or by choosing New and selecting a new graph. A window labeled Graphics 1 appears. This window has a blank graphics area, a vertical axis labeled 0 to 100, and a horizontal axis labeled with tick marks.

**Selecting the Graph Type** Your next step is to select a type for your graph from the Type menu. Your selection from this menu, the major type, determines the basic structure of the graph and the

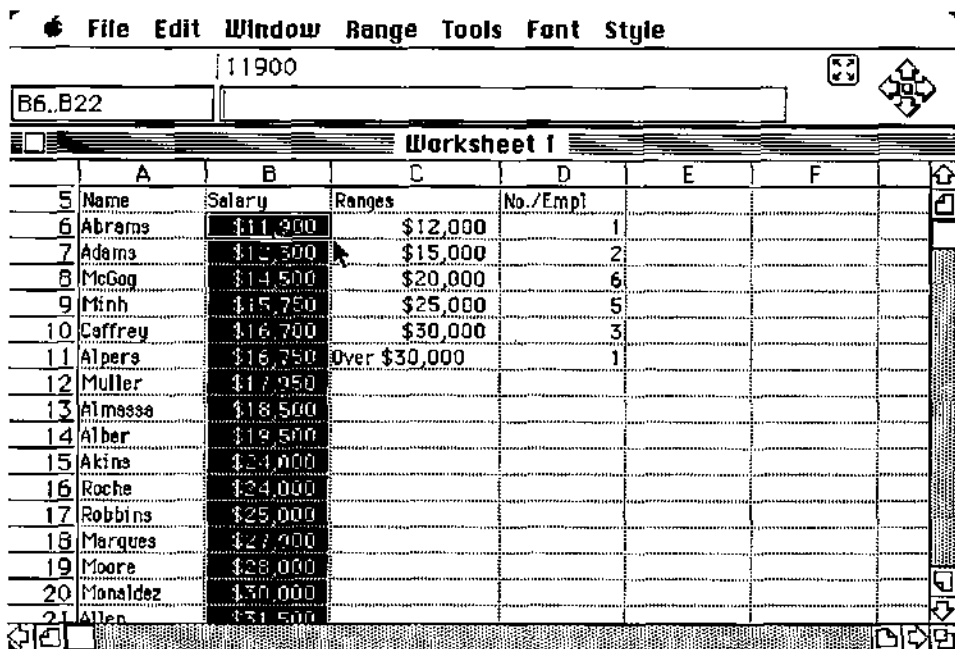


Figure 5.1: Select the data to be graphed by highlighting it.

different forms that can be plotted at the same time. While overlapping of graph forms that are the same basic type, such as bars and lines, is easy. Different types, such as pie charts and bar charts, cannot be plotted at the same time.

If you change your mind about the type you selected, you can easily change to a different one. Simply choose another type from the Type menu and the existing graph will be converted to the new type. You can just as easily change the graph back to the earlier display by selecting your original choice again. So you can feel free to experiment with different kinds of displays to find the one that best suits your data.

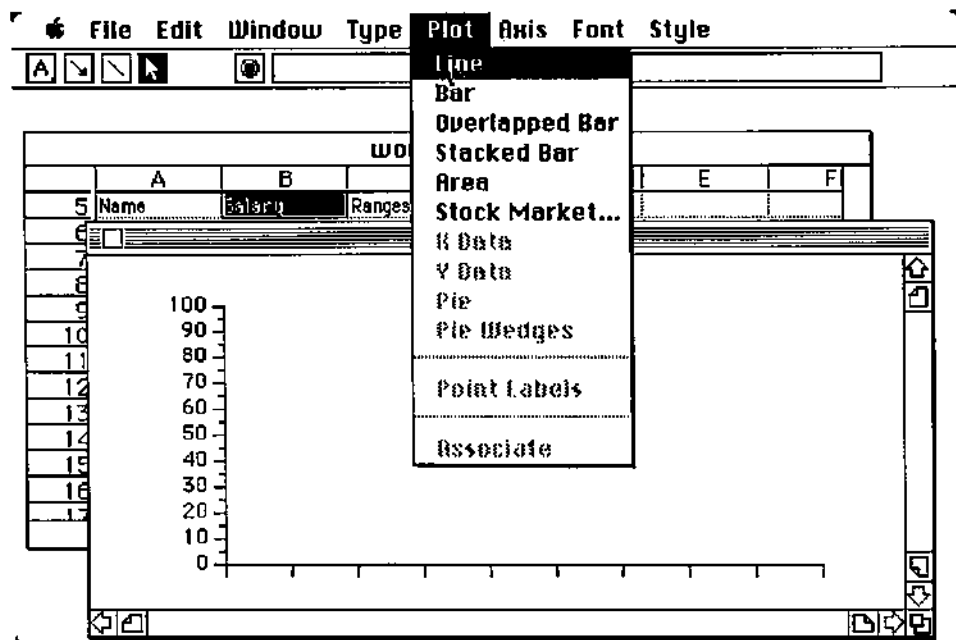
**Plotting the Data** After you choose the major graphic type, you select the specific form of the graph from the Plot menu, as shown in Figure 5.2.

The possible plot forms for the type that you selected are available; the others are inactive. You can mix and match plot forms from those shown as active. For example, from the menu shown in Figure

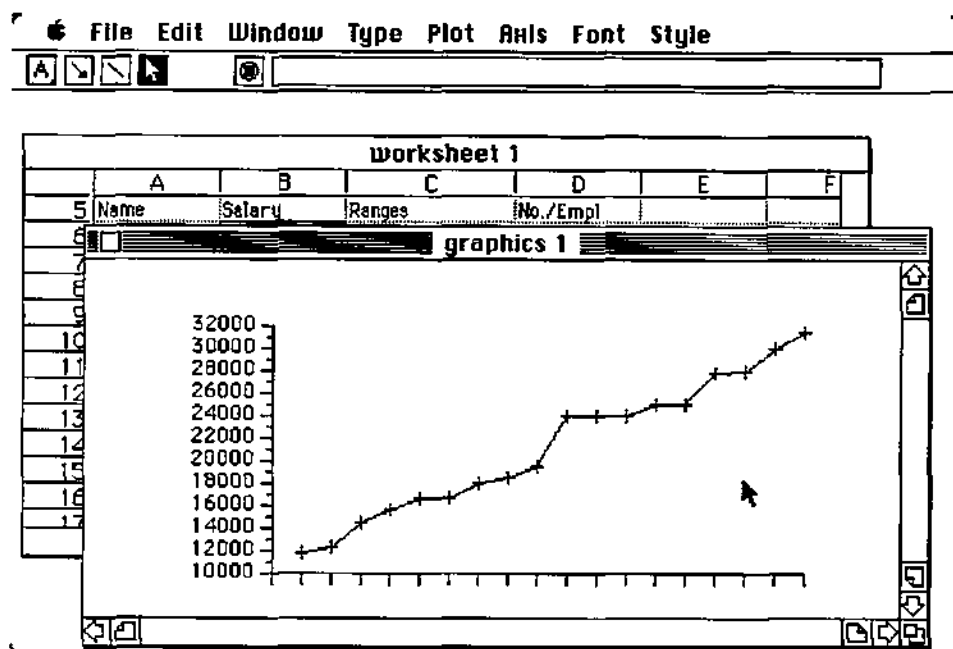
5.2, you could select line, bar, overlapped bar, stacked bar, area, and stock market-type charts to show different kinds of data on the same display.

When you select a plot form, the data are immediately plotted on the graph in that form. The horizontal and vertical axes adjust automatically to the proportions. For example, in the line graph shown in Figure 5.3, the vertical axis changes from units of ten from 0 to 100 to units of two thousand from 10,000 to 32,000 because that's the range of the salary data highlighted in Figure 5.1. If additional plot points are added that extend that range, the axes will adjust as necessary. (It's also possible to format the axes labels using the Axis menu, as explained later in this chapter.)

**Adding Data Ranges to the Graph** After you plot one data range on the graph, you can add more data ranges by repeating the same steps. Go back to the worksheet, or to another worksheet or database file, and highlight another data range. Then return to the



**Figure 5.2:** To plot the highlighted data, select the kind of plot desired from the Plot menu. The data is plotted on the graph instantly.



**Figure 5.3:** The first data range is plotted on the graph in the form of a line chart, with the left axis automatically adjusting to the range of salaries being plotted.

Graphics window and choose a plot form from the Plot menu. The new data points are then plotted.

A word of warning: each time you select a plot form from the Plot menu, the most recently highlighted data points are immediately plotted. If you select a different plot form for a data range that has already been plotted, Jazz will plot the same data points *on top of the first plot*—it will not replace the previous plot (clearing data ranges is discussed below).

**Clearing Data Ranges from the Graph** To clear unwanted or obsolete data ranges from the chart (if, for example, you accidentally rechart the same data points), click on the Plot Selector icon directly below the Window menu. A circular marker will appear on each data point in one of the plots on the current chart. Click the Plot Selector icon repeatedly to cycle through all the data ranges on the chart. When you've highlighted the desired data range with the plot selector, choose Clear from the Edit menu. (Clear is only active

when the plot selector or the Select All command, which is described with the Edit commands, is being used.)

You can turn off the plot selector either by clicking the cursor on any point within the Graphics window, by activating a different window, or by saving the Graphics window.

If you clear data from the worksheet or database source, its plot will disappear from the related graph. However, if you enter new data in the area that the cleared data occupied, the new data will be plotted instead. If you actually want to delete plots from a graph, it's a better idea to use the plot selector and the Clear command.

It's also possible to "wipe the slate clean" and start over with a graph. Use Select All on the Edit menu, then choose Clear on the Edit menu. You'll return to a blank graphics display.

**Updating the Data** Data on a graph is always actively linked to its source, whether it's based on a worksheet or database. If you change numbers in any data range in the source, this change is reflected in any graphics display created with this range. The graphics display always reflects the latest values of its sources.

If you clear the database or worksheet data, it disappears from the graph. If you enter new data in the range that had once been highlighted (and has now been cleared), the new data are plotted in place of the old data, in the plot type that you previously selected.

If you cut the the database or worksheet data from its location, it will disappear from the graph. However, if you then paste the data elsewhere on the same worksheet, it will reappear on the graph. And, if you enter different data in the previous location, it is also plotted. So, be careful when cutting and pasting data linked to graphics because you can cause plots to proliferate.

However, if you cut from one window and paste to another window, the plot won't reappear on the graph.

If you paste a graph into a word processor document, it will remain in the form that it was at the time you pasted it. However, if you use the special HotView feature of the word processor module to paste an active copy of the graph, the HotView copy will reflect every data change in the original Graphics window, as well as any label, style, or font changes that you make in that original window. This feature lets you put a temporary graph into a preliminary report, knowing that as the graph is refined, the changes will appear in the report.

**Labeling the Graph** Once you've plotted the data points, you can identify them. You identify the data by labeling axes, setting legends, and writing comments and drawing arrows on the graph itself. You can select the type font and style for some of the text elements of the graph. The result can be a fully professional-looking graphic display (or if you become too enthusiastic, you can create quite a jumble of typefaces and styles).

**Labeling Axes** Jazz automatically sizes the left axis to fit the data range and labels it at appropriate intervals. You can modify the way these automatic axis labels are displayed by selecting the axis (left, right, top, or bottom) from the Axis menu. Full details on the commands in this menu are given later in this chapter. In summary, you can:

- Format the numbers with such formats as Currency, Comma, and Percent.
- Change the numbering intervals or delete the numbering and leave only tick marks.
- Enter a title for the axis.
- Select labels for the bottom axis either from the data values themselves or from another highlighted range on the source worksheet or database.
- Delete display of an axis altogether.
- Overlay a grid to clarify the exact location of data points on the graph.

**Setting Legends** A legend is a key to the symbols used in the graph. When you select Set Legend from the the Style menu, a display appears next to the graph. This display shows a small box for each pattern used in the graph and a larger box into which you can type the meaning for that pattern.

**Writing on the Graph** By selecting one of the well icons below the menu bar of the graphics window display, you can type free-form entries anywhere in the Graphics window and draw arrows and lines connecting labels and data points.

Three boxes in the upper left corner of the Graphics screen, just below the menu bar, are used to make such entries. The first box, the one with the letter A, is the notation well; the second box, the one with an arrow, is the arrow well; the third box is the line well,

and the fourth box is the cursor well. Think of these as inkwells into which you can dip the cursor to write characters, draw lines, and display arrows. Clicking the cursor well returns the cursor to its normal function.

To write on the chart, click the notation well. When you move the cursor to the Graphics window, it becomes cross-hair shaped. You can now drag open a notation box anywhere in the Graphics window. A text-insert cursor appears in the notation box, and you can type whatever you wish in it. If what you type reaches the right side of the box, Jazz will start a new line providing there's enough room for another line (the Return key doesn't function when you're typing in a notation box). If there isn't enough room, Jazz will beep; just move the cross-hair cursor to the tiny black square (the size box) in the lower right corner of the box and drag on it to make the notation box bigger. Then you can continue typing.

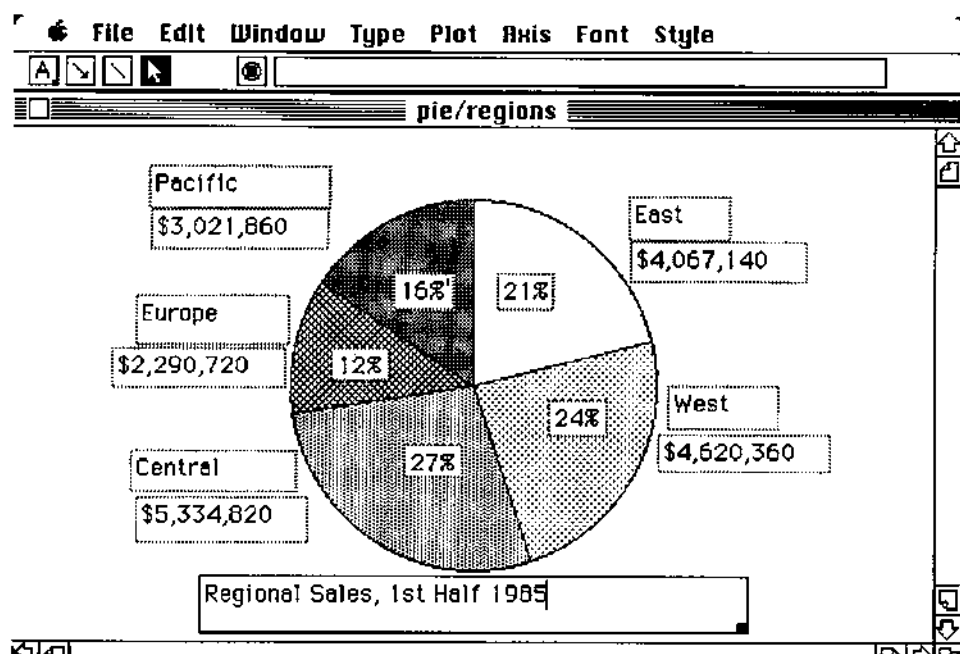
If you finish typing and then find that some or all of the text has disappeared (it does this in whole word units), just make the notation box bigger by dragging the size box until the missing text reappears.

Figure 5.4 shows notation boxes on a pie chart. Notice that the active box—the one on the bottom with the words Regional Sales—has a solid outline and a small black size box in the lower right corner.

If you put the cross-hair cursor anywhere on the notation box outline, except on the black size box, you can drag the whole box and its contents around the graphics display to anywhere you want, including over top of the plot lines and bar displays. The only place that the box won't go is onto or through another notation box. However, if you drag the cursor through to the other side of the obstructing notation box, the notation box that you're trying to move will pop up on the other side.

Click anywhere outside the notation boxes to clear the box outline, leaving behind the characters that you typed. Click the cursor inside any notation box (you can tell when you're inside an invisible notation box because the cursor takes on a text-insert or a cross-hair shape) and the notation box outline reappears. You can then insert or delete text and move or expand the notation box.

You can delete one of the notation boxes by selecting that notation box. Click the cursor inside the notation box until the outline reappears; the selected box will have a solid outline. Then choose Clear from the Edit menu. That notation box and its contents will disappear.



**Figure 5.4:** Notation boxes can be put anywhere on the graph, including inside the figure; the active box is the one at the bottom.

Each time you create a notation box, you've got to dip your cursor in the notation well; however, to work with existing notation boxes, all you have to do is click them with the cursor.

You can select a notation box and use the Font and Style menus to change font size and type style. Figure 5.5 shows the same pie chart with the notations emphasized by changing the type size and style.

To draw arrows, click the arrow well. Move the cursor to a position in the Graphics window, hold down the mouse button, and drag the cursor. A line appears in your wake. When you release the mouse button, an arrowhead appears at the end of the line. There are two temporary drag boxes, one at each end of the line, that you can use to move the end points of the arrow to change its position and its size. When you click anywhere outside the line, the drag boxes disappear.

To move an arrow, move the cursor to the arrow until the cursor changes to cross-hair shaped. If you hold down the mouse button and drag, the arrow will move with the cursor. If you grab either end of the arrow line, rather than some point in the middle, the



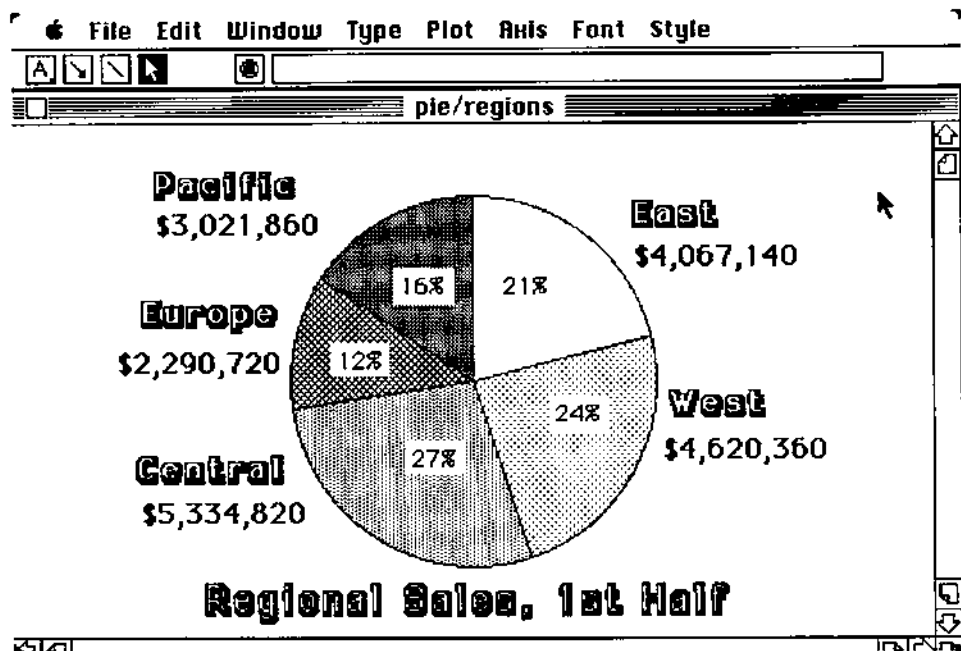


Figure 5.5: Notations can be in any font, size, and style.

arrow line will pivot instead of move, so you can change the start point or end point of the arrow and extend or reduce the length of the arrow line.

Figure 5.6 shows the use of arrows to clarify notations.

You can delete an arrow by selecting it (you can tell it's selected because its drag boxes are visible) and then choosing Clear from the Edit menu.

Drawing a line is similar to drawing an arrow. Click the line well and drag out a line. You can use the line's drag boxes to move, pivot, expand, and contract it. You can delete a line by selecting it and choosing Clear on the Edit menu.

### Printing the Graph

There are three ways to print a graph:

- You can simply print the screen by holding down the Shift and Command keys and typing the number 4. A copy of the active window is printed in Standard quality. This is useful for immediate reference.

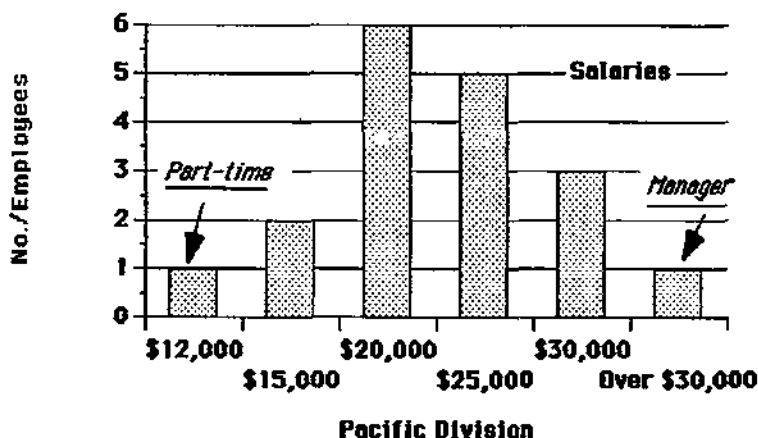


Figure 5.6: Using arrows to highlight a graph.

- You can paste a graph or include a HotView of it in a word processor document and print it as part of the word processing file.
- You can use the Print Document command on the File menu to print only the graph. As with printing other kinds of files, you first select the setup you want from the Page Setup dialog box, then choose the Print Quality from the Print box.

There are several things to consider when you print a graph using the Print Document command. If your graphics, especially your pie charts, seem distorted, choose Tall Adjusted as the Orientation option on the Page Setup dialog box. This prints the graph somewhat wider, which makes pie charts come out round instead of oval. When selecting the Print Quality from the Print box, choose Standard or High. If you choose Draft, only the labels and notations will print, not the graph itself.

Another factor you may want to consider when printing a graph is its size. Normally, the graph is sized to fit into the window displayed on the Macintosh. The printout is then roughly the same size as the Macintosh display. However, you can choose the size and proportions of your graph using the Size command on the Style menu. This command displays a dialog box in which you can choose the graph's height and width, in inches. (The default size is seven inches wide and five inches high.) Then choose Show Actual Size from the Size box. The graph is displayed on the screen, and printed, in the width and height that you selected. Note, however, that text

in the notation boxes is displayed and printed in the same size, regardless of the proportions of the graph. To resize text to suit the changed graph, select the appropriate size from the Font menu.

If you paste the sized graph into a word processor document, it appears in the document in the size that you chose. However, if you inserted a HotView of the graph, it will be sized to fit the margins of the word processor document.

**The Graphics Pull-Down Menu Commands** The File and Window menus are described in detail in Chapter 1. In this section, we will discuss the menu commands unique to the graphics module.

**The Edit Commands** In the graphics module, various edit commands are available depending on what you're doing.

**Cut** The Cut command only works when you've highlighted some text in a notation box or a legend box. Then you can cut that text, which deletes it and puts it on the Clipboard so that you can paste it elsewhere.

**Copy** The Copy command is available either when you've highlighted text in a notation box or legend box or when you have used the Select All command (described below) to select the entire Graphics window. The material is copied to the Clipboard but not erased from the Graphics window. Use Copy with Select All to paste or include a HotView of a graph in a word processor document (see the Working with the Word Processor section later in this chapter).

**Paste** The Paste command is available after you've cut or copied text from a notation box or legend box. Select another notation box or legend box, position the cursor, and paste. If the pasted material doesn't appear, the box may be too small for display. Simply make the box larger and the text should appear. Paste is not available if you haven't selected a notation or legend box.

Paste is also available if you use the Select All and Copy commands to copy the entire graph, then switch to a word processor document. You can then use Paste on the Edit menu or Include on the HotView menu to transfer the graph to the word processor

document beginning at the cursor position. You can't use Paste to duplicate a graph by inserting it into another Graphics window.

**Clear** The Clear command erases whatever you have highlighted:

- The entire graph using the Select All command
- The selected notation box or legend box
- Highlighted text in a selected notation box or legend box
- A selected arrow or line
- A plot selected with the Plot Selector icon

If you delete a plot with Clear, the connection to the linked worksheet or database is severed. If the Graphics window is deleted with Select All and Clear, the graph reverts to an empty display of the active graphic type (for example, you'll see an empty pie chart or bar graph display).

**Select All** The Select All command selects the entire graph. The graph can then be cleared or copied for use in a word processor document. No other commands are active while the Graphics window is selected.

**Duplicate** This command simplifies creating notation boxes, lines, and arrows. When a notation box, line, or arrow is active, use Duplicate to create a copy of the item right next to it on the graph. Duplicate Notation creates a duplicate notation box with duplicate text, which you can move elsewhere in the graphics display and edit. Duplicate Line or Duplicate Arrow creates another line or arrow, which can be moved, pivoted, lengthened, or shortened. If you want to create several notation boxes of the same size or with similar phrasing, a series of identical arrows, or a series of duplicate lines, this command speeds up the process.

Jazz beeps if the duplicate notation box would run off the side of the Graphics window or run into another notation box.

**The Type Menu** The Type menu chooses one of four basic structures for the graph. The options available in the Plot menu

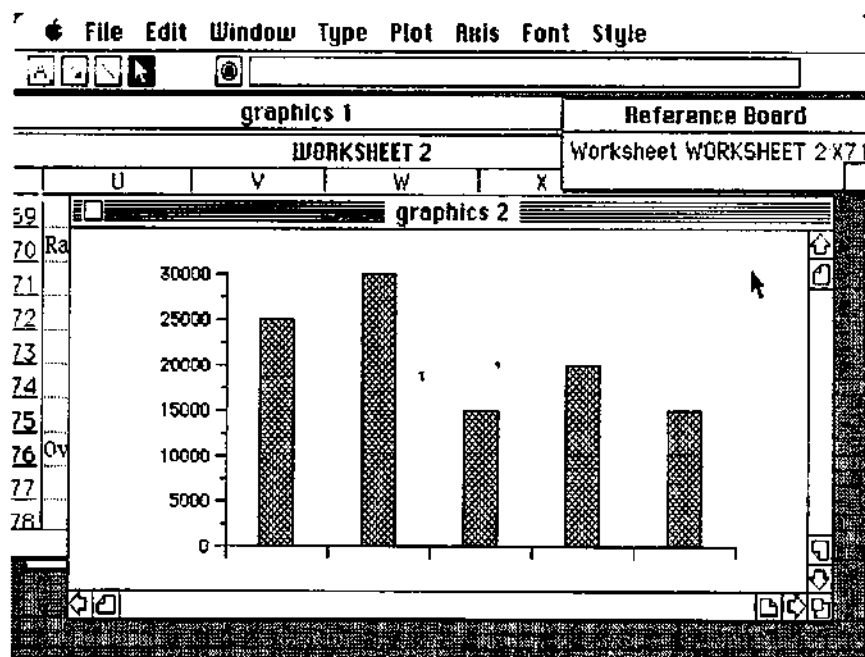
depend on what selection you make on the Type menu. The following major types are available:

- The **Line, Bar, & Area** selection makes it possible to choose from the Plot menu any mixture of line, bar, overlapped bar, stacked bar, area, or stock market plots.
- The **Pie** selection gives you the pie chart structure. No other plot types can be used with a pie chart.
- The **Scatter** selection lets you plot data points against the x and y axes.
- The **Percent** selection lets you plot data as percentages of a whole, which you can do using a stacked bar or an area plot.

You can change the structure of an existing graph, and Jazz will reconstruct the graph points in the new structure as best it can. If the new structure is a pie chart, Jazz will draw a separate pie chart for each plot. You may find that the data do not make sense in the new structure. For example, a percentage version of a bar chart with only one plot will consist of bars that are all the same height. Further, notation boxes, arrows, and lines will have to be rearranged when the graph structure changes. You can, however, change the structure back again if the new approach doesn't work. In some cases, though, Jazz may warn you that data will become garbled or lost in the attempt to convert to a new structure. If this happens, you may not be able to recover the missing data points upon returning to the original structure.

**The Plot Menu** The Plot menu does the actual drawing of a plot from the selected data. Each time you select an option from the Plot menu, Jazz plots the data points highlighted in the most recently active worksheet or database.

A word of caution: If you are plotting one worksheet, then activate another Worksheet window to check something, when you switch to the Graphics window, you'll find yourself plotting whatever happened to be highlighted on the second Worksheet window. To avoid this, make sure to return to the correct worksheet before activating the Graphics window. If you're switching among several windows while constructing your graphics display, keep the Reference Board open in a corner of the screen to keep track of the most recently active window, as shown in Figure 5.7. (Select the Reference Board from the Window menu.)



**Figure 5.7:** To keep track of many windows, leave the Reference Board open in a corner of the screen; it will tell you which window and range is being plotted.

The Plot menu types are grouped. If you choose Pie on the Type menu, only the Pie and Pie Wedges selections will be active on the Plot menu, and only pie charts are generated. If you choose Scatter as the type, only X Data and Y Data will be active on the Plot menu, and all plots generated are of this type. If you choose Percent on the Type menu, Area and Stacked Bar are available on the Plot menu, and you can mix plots of both types.

Within the Line, Bar, & Area Type, several kinds of plots are available: Line, Area, Stock Market, and one of three kinds of Bars. You can combine these plot types on the same graph.

**Line Plots** Line is active when the Type selected is Line, Bar, & Area. Line plots are useful for showing a pattern of rising and falling values. Selecting Line from the Plot menu causes Jazz to immediately draw a plot of the active data as a series of points connected by a line. The first point plotted is the first element (counting from the top or from the left) in the data range you highlighted in the

most recently active worksheet or database. The second point plotted is the second element in that data range, and so on. If you highlight a range of several rows or columns of data, Jazz plots them all in serial order, rather than creating separate plots of each row or column.

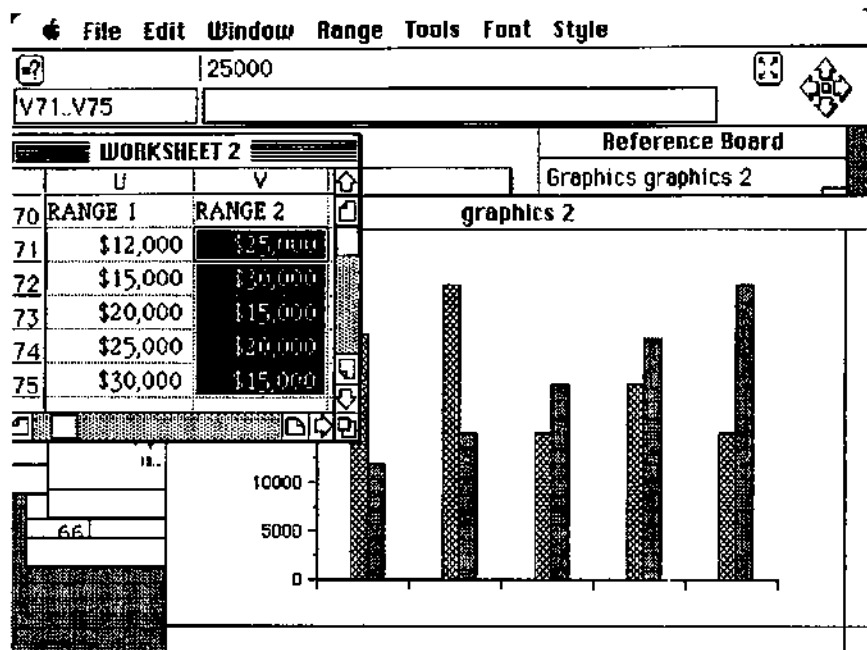
To plot another line of data points, highlight another data range on the same or another worksheet or database, return to the Graphics window, and select Line from the Plot menu. Jazz plots the new set of data points and draws a line through them. Repeat this procedure until all the data are plotted.

If you plot the same data twice, Jazz draws a new line on top of the existing line, although the overlap is so close it's hard to notice. However, when you use the Plot Selector icon, it will seem to repeat itself in the same position. Use the Plot Selector icon to mark and clear the duplicate.

If the current data range being plotted contains more data points, Jazz adjusts the horizontal axis of the chart to accommodate them by adding more tick marks. If the data range is outside of the maximum value of the previous ranges, Jazz adjusts the vertical axis to accommodate the extended range of values. If the range is too great (for example, one plot ranges in value from 10 to 20 and the second ranges from 5,000 to 30,000), the lower valued plot will almost disappear from the chart. You should then consider using the Associate command on the Plot menu (explained below). Alternatively, you could go back to the worksheet and adjust the ranges (by reducing the larger range or multiplying the smaller one by some factor) to bring them within plotting distance of one another. In our example, dividing the larger range by 100 or multiplying the smaller range by 100 would allow them to be plotted in the same order of magnitude.

You can combine line plots with bar plots and area plots on the same graphics display to contrast differing data.

**Bar, Overlapped Bar, and Stacked Bar Plots** The bar plots represent each data point as a bar whose height is proportional to the value of the data point. The bar plots work the same way as the line plots. You highlight a range, select one of the bar options, and one bar is drawn for each data point. When you select and plot the next set of data, the second set of bars is paired against the existing bars, the first value with the first value, the second value with the second value, and so on. In the bar chart shown in Figure 5.8, the left bar of



**Figure 5.8:** A bar chart: the first value in Range 1 of the worksheet (\$12,000) is paired on the bar chart with the first value of Range 2 (\$25,000), and so on.

each pair represents Range 1 and the right bar of each pair represents Range 2. Each new range that you plot adds another group of bars.

You can add line or area plots to a graph with bar plots, but you can only have one kind of bar plot at any one time. If you have a bar chart and plot some values by selecting Overlapped Bar or Stacked Bar, all the bars on the chart immediately convert to overlapped or stacked bars. However, any line, area, or stock market plots remain the same.

Bar charts are useful for showing relative values in groups of related data. Overlapped bars take up less room and so are useful when there are a lot of data to plot.

Stacked bars show totals of component data and, to a limited degree, the contribution of the components to the whole (pie charts are more useful for showing components). When using stacked bars in a Percent chart, the bars are all the same height, with the components valued as percentages of the whole. This shows the relative contribution of the components to their bars, even though the totals



represented by the bars may be different. A combined bar and percentage chart would be useful for showing, for example, the relative contribution of salespeople to sales in each of several regions.

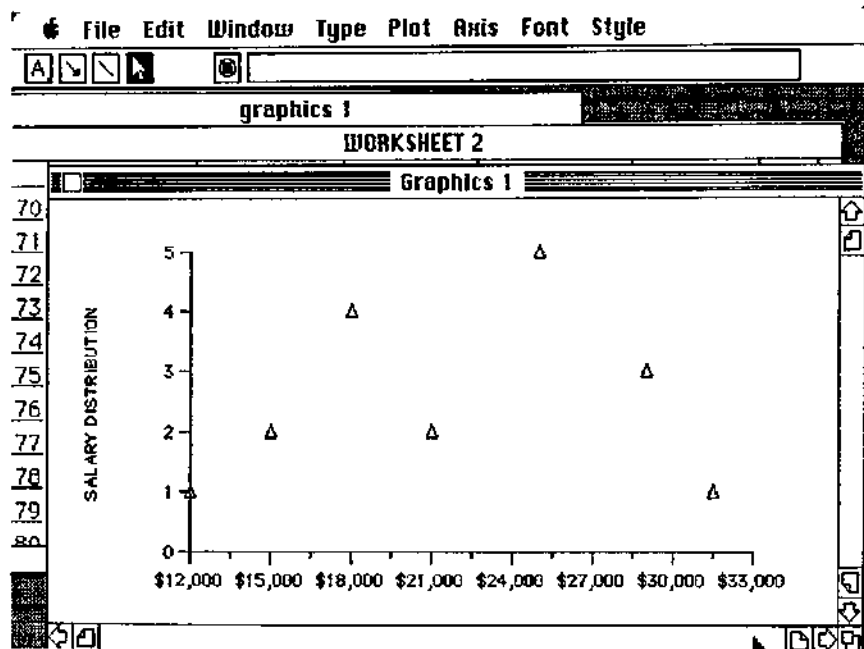
**Area Plots** In an area plot, the data are entered as a series of points with a line connecting them (just like the line plot), and then the area beneath the line is filled with a pattern. You can change the pattern using selections on the Style menu. When you plot the second data set, it is added to the value of the previous plot, so the whole filled area represents the total of the values of the first and second plots. In this way, it is similar to the stacked bar plot.

And like the stacked bar plot, area is available with the percent type, which you can use to show relative values out of a total of 100 percent.

However, the area plot type not only shows relationships, but also changing trends from one side of the graph to the other. Area plots are frequently used to plot changes over time of the components contributing to rising totals. (Using the Percent type with an area plot normalizes the rising or falling total values and concentrates on the changing percentage contribution.)

**Stock Market Plots** Stock market plots have a specific use: plotting the opening, closing, and high and low prices for stocks and commodities. When you choose Stock Market, you're asked if the data represent the high, low, open, or close price. You'll need between two and four data ranges, plotting each separately. If you select a choice that has been selected before, the new data range replaces the old (which is contrary to the way all the other plot types work).

**X Data, Y Data Plots** The x and y data plot choices are active when you select Scatter as the plot type. A scattergram may resemble a line plot in some ways, but it is plotted very differently from any of the preceding graph types. In the other plot types, the first value is plotted in the first position, the second in the second position, and so on. In a scattergram, each data point on the chart represents two values, one on the x (or horizontal) and one on the y (or vertical) axes of the graph. This is useful for displaying distributions. For example, Figure 5.9 shows a simple plot of a frequency distribution for salaries in an office, summed in groups in increments of \$3,000. There is one person being paid \$12,000 and one being paid about \$31,500. Patterns can be seen: there is a group of people at about \$18,000 and a group at about \$25,000. This might have implications for a personnel planner.



**Figure 5.9:** A scattergram of office salaries shows how many people are paid in each salary grouping.

To create the chart in Figure 5.9, we used Jazz's frequency distribution function in the worksheet (see Chapter 4) to calculate the distribution of salaries. We highlighted the salary ranges (bins), went to the Graphics window, chose Scatter on the Type menu and X Axis on the Plot menu. Jazz put the data in order and entered it along the horizontal axis. (Regardless of the order the data are in when highlighted, Jazz puts x-axis data in ascending value order.)

We next highlighted the distribution numbers on the worksheet, which told how many people fit into each salary category, then selected Y Axis on the Plot menu. Jazz plotted these points against the y axis, assuming the data are in the **same order** as the x-axis data was before Jazz sorted it, so the data will correspond.

The x-axis value that you enter is the label for the horizontal axis. You can only enter one x-axis value in a scattergram. If you make another x-axis entry, it will replace the previous one. The y-axis entries, on the other hand, are the actual data points plotted against the x and y axes. You can enter several ranges of y data on the same graph.

**Pie Charts** A pie chart is a circle in which each value in a highlighted range is a wedge. The size of the wedge shows how large the value is compared with the other values in the range. The whole pie chart represents the total of the values in the range.

To create a pie chart, first highlight a range of values on a worksheet or database. Activate the Graphics window and select Pie from the Type menu, then Pie from the Plot menu. Jazz draws a pie chart, starting at the twelve o'clock position and moving clockwise, including a pie wedge for the first value in the range, then a pie wedge for the second value, and so on until the circle is complete. If you select a range, Jazz works down the leftmost column, then continues with the next column on the right; rather than starting a new pie chart with the next column, Jazz puts all data points in the range on the same pie chart.

If you highlight another range on a worksheet or database and select Pie again from the Plot menu, you get a second pie chart next to the first. Each time you select Pie, you get a new pie chart representing the new data points. The pie charts will be sized to fit in the window.

Pie charts are useful for showing growth in relative values. For example, Figure 5.10 shows that the factor represented by the third wedge (which has been separated, or "exploded," from the other wedges for emphasis) is growing more rapidly quarter to quarter as a percentage of the whole than any of the other wedges. This could be a product line, a cost area, or a voting pattern.

Point labels (described below) for pie charts appear next to each wedge, as shown in Figure 5.10. You can use notations, arrows, and lines on a pie chart, but you can't include any patterns, symbols, grid lines, or legends (these commands on the Style menu become inactive when you select Pie). The Lines command on the Style menu becomes active when you select a line (by clicking on it) that you've drawn with the line well. View Horizontal on the Type menu, Associate on the Plot menu, and all of the commands on the Axis menu are inactive because they refer to orientation with regard to an axis, and pie charts don't make use of axes.

**Set and Clear Pie Wedges** Exploding a pie wedge, or pulling it out slightly from the rest of the pie chart, is a way of emphasizing one or more wedges. In Figure 5.10, the wedge representing the major growth area is exploded from the others. You can explode any or all of the wedges of the pie.

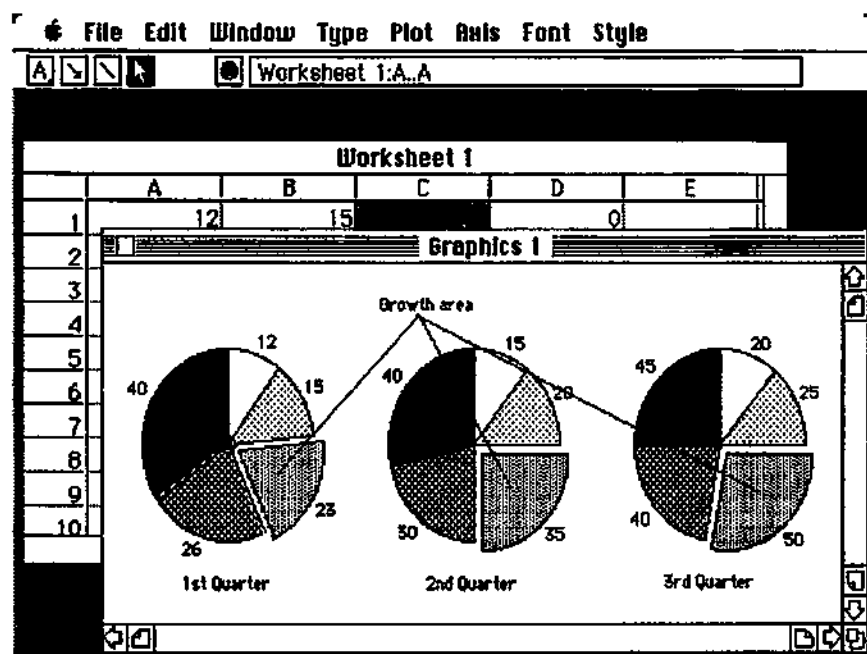
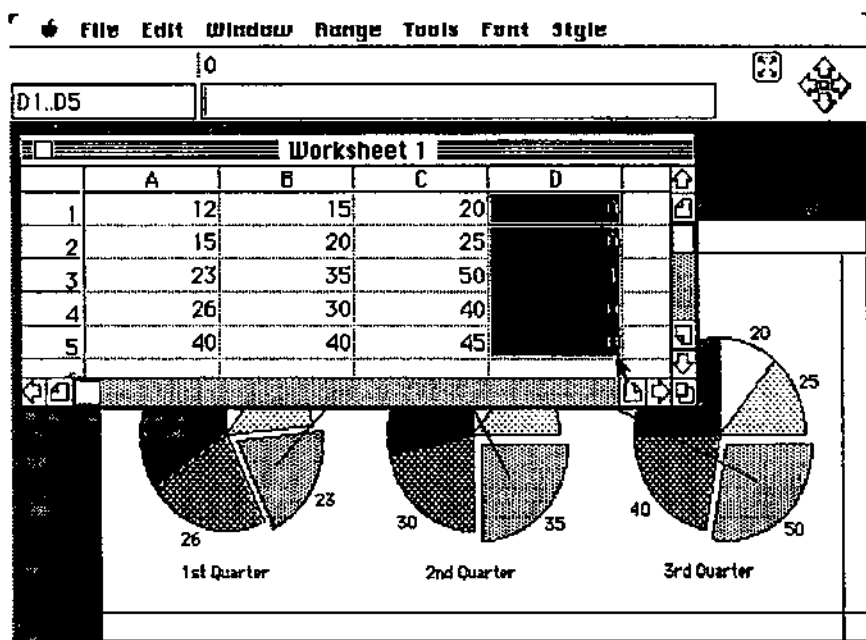


Figure 5.10: The "exploded" area of this pie chart shows significant relative growth over the other areas in the course of two quarters.

The Set Pie Wedges and Clear Pie Wedges commands are active when you've selected a pie chart by clicking the Plot Selector icon. To let Jazz know which wedge to explode, you need to create a list of values for the wedges somewhere on a worksheet or a database. To explode the wedges in Figure 5.10, we've set up a range of numbers in a worksheet, as shown in Figure 5.11.

In Figure 5.11, the values in column D correspond to the number of wedges in any one pie chart (the range used for explosion values can be anywhere on the worksheet or database; it doesn't have to be next to the charted data). Highlight this range, then activate the Graphics window and select Set Pie Wedges from the Plot menu. Jazz checks the highlighted range, matching each value with a pie wedge starting at the top of the pie and working around clockwise. If a value is zero, Jazz skips to the next cell and the next wedge; if the value is anything other than zero, Jazz explodes the corresponding pie wedge. (Since we only exploded the third wedge, we could have highlighted only the first three cells and gotten the same result.)



**Figure 5.11:** The exploding wedges range on the worksheet shows Jazz which wedge—the one whose value is 1—to explode.

To explode wedges from the next pie chart, select it by clicking the Plot Selector icon, then select Set Pie Wedges again. You can use the same explosion range repeatedly to explode the same wedge on each chart, as we did in Figure 5.11.

Selecting a pie chart that already has an exploded wedge activates the Clear Pie Wedges command in the Plot menu. Choose this command to bring the exploded wedges back into the pie chart.

**Point Labels** The Point Labels command is one of the labeling commands for identifying the components of a graph. It automatically labels the points on a line graph, area graph, or scattergram; the wedges of a pie chart; the bars on a bar chart or overlapped bar chart; and the components of a stacked bar graph. To use this command, first select a range of values or text on a worksheet or database, then activate the Graphics window. Select the appropriate data display on the graph and choose Set Point Labels from the Plot menu.

The information in the selected range will be displayed next to the corresponding data points on the graph. The first entry will be in the label field next to the first data point, the second entry next to the second data point, and so on. If you choose the actual values of the data points, you'll have a chart with exact values as well as a graphic illustration of those values. If you choose text, those labels will appear on the graph. In some cases, using the Point Labels command is easier than using the notation well.

If the entry is too long to fit into the area in the graph, part of the entry will be replaced by three dots to indicate missing text. You can't move or resize these labels, so you may have to use abbreviations if they don't fit. Alternatively, you could remove the graphics elements that block the label, and the remainder of the text may appear.

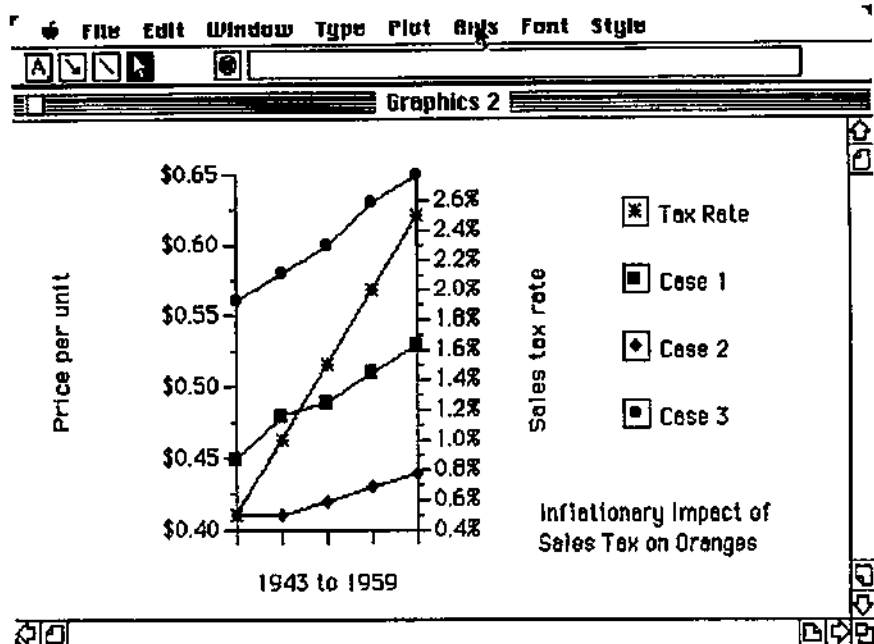
Once you've used point labels on a plot, selecting that plot again activates the Clear Point Labels command on the Plot menu. Use this command to delete data point labels.

**Associate Right/Left Axis** The Associate command on the Plot menu is used when you're comparing trends in two data groups that have values that are different by orders of magnitude. For example, if you were trying to show the influence of sales taxes on orange juice prices by graphing two line plots, you'd want one line to be plotted against a vertical axis marked in sales tax percentages in a range of maybe half a percent to ten percent, in quarter-percent increments. But the orange juice prices would be in cents per unit, and they may range from one cent to over a dollar, depending on the units used.

You can use the Associate command to compare disparate but related value ranges by graphing some data sets against the left vertical axis and other data sets against the right axis (with the left axis marked differently from the right axis). Figure 5.12 shows a graph that compares rising sales taxes over time with orange prices.

If you simply graphed the data shown in Figure 5.12 on the same axis, the three ranges in the 0.40 to 0.65 range would dominate the graph, and the tax plot would be almost invisible.

To use the Associate command, first plot the range, and Jazz will automatically plot it to the left axis. Then select the plot with the Plot Selector icon and choose Associate with Right Axis on the Plot menu. If this is the first Associate command for the graph, Jazz creates a right axis that is proportioned appropriately for the selected plot.



**Figure 5.12:** The left axis is in cents and the right axis in percent to show a pattern of price rises with increased taxes.

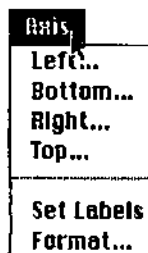
The easiest way to create this type of graph is first to plot the fewer points and then use the Associate command to plot them against the right axis. Then let Jazz automatically plot the more numerous points against the left axis. This also helps you to keep track of the plots.

If you are plotting a stacked bar or stacked area chart, associating any one plot with the right axis causes the rest of the stack to associate with that axis as well.

Once a plot is associated with the right axis, selecting it will activate Associate with Left Axis on the Plot menu, so you can switch plots back and forth.

Once you've activated the right axis, you'll be offered right axis choices in the dialog boxes displayed by the Set Labels and Format commands in the Axis menu.

**The Axis Menu** You use the commands on the Axis menu, shown in Figure 5.13, to handle matters that relate to the way that the graph axes are labeled.



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**Figure 5.13:** *The Axis menu.*

The Left, Right, Top, and Bottom commands let you title the axes, manually set the scaling and intervals, and alter the type of tick marks used to scale the axes. The Set Labels command labels the axis with the text or values that you've highlighted on a worksheet or database. The Format command lets you format the values used to scale the axes in the same way that you format cells in a worksheet or database.

**Left, Bottom, Right, and Top Axis Settings** The Left, Bottom, Right, and Top commands let you make certain alterations in the named axis. Figure 5.14 shows a typical window displayed when you select one of these commands.

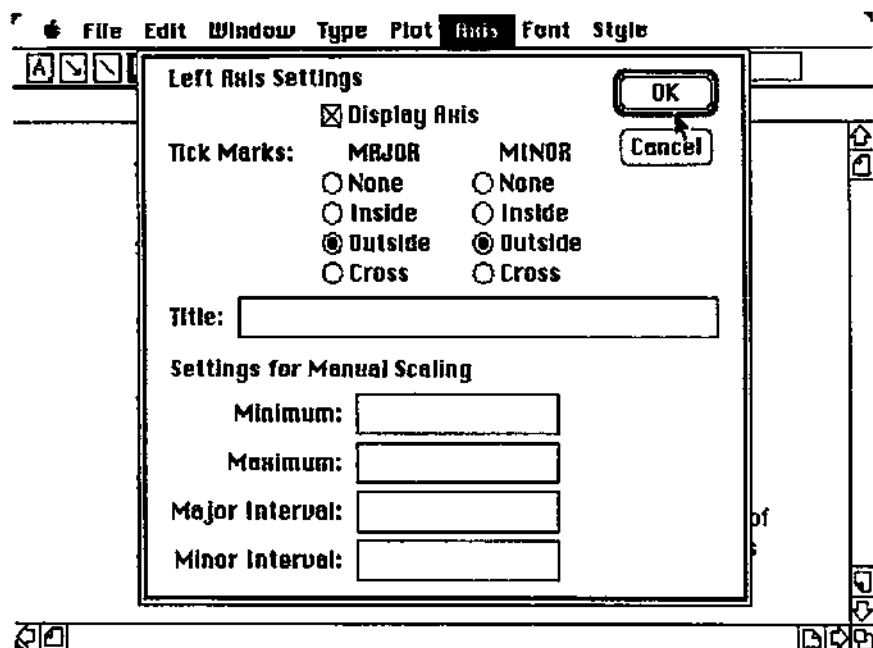
Click **Display Axis** to delete the check mark, and that axis will disappear from the graph. Click it again to display the axis.

The **Tick Marks** selections let you alter the display of tick marks that divide the axis into regular intervals. Major tick marks are ones that are labeled by Jazz; minor tick marks are unlabeled smaller lines that mark intervals between major tick marks. You can eliminate either kind of tick mark or change the way that they are displayed on the axis.

In the **Title** box, you can type 30 to 40 characters of text to title that axis; vertical labels will be displayed sideways to make room for the title. Unlike notation box and legend box text, you can't use different fonts for individual titles or labels. If you change the font selection while viewing a graph, the labels and titles that you inserted using an Axis menu command will change to the new type font, size, and style. If the title is too long to fit on the graph, Jazz will include a portion of it, followed by three dots to indicate that there is more text.

The **Settings for Manual Scaling** option lets you override Jazz's decisions about the range and intervals at which to set the axes. You



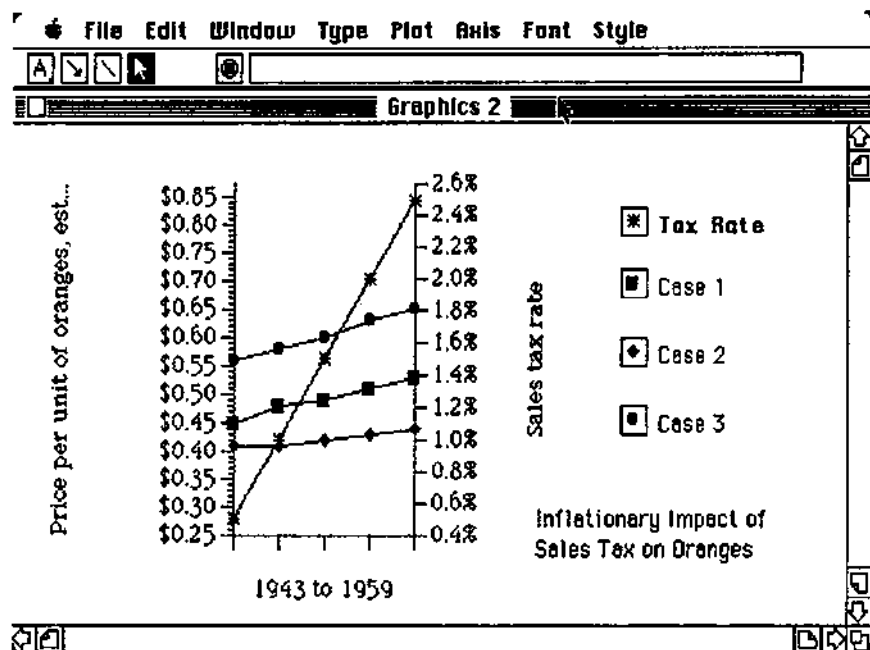


**Figure 5.14:** A typical axis settings menu display lets you alter settings for the left, right, top, or bottom axis of a graph.

can use the boxes next to Maximum and Minimum to set the range of the axis. For example, in the case of the orange juice price list in Figure 5.12, Jazz chose a minimum value of 0.40 and a maximum value of 0.65. We can change that range so that the left axis starts at 0.25 and runs to 0.85.

Note that changing the ranges of the axes changes the slope of the plots, which may make them appear more or less dramatic than you intended. If you're using both right and left axes, changing the settings of the two axes can distort the apparent relationship being proposed, for better or worse. Figure 5.15 shows that widening the price range in our orange juice example minimizes the apparent speed of the price increases compared with the tax increases. Such rearrangements can highlight, or obfuscate, an important point being graphed.

In the Major and Minor Intervals boxes, enter the increments that you want to mark. Jazz normally marks intervals based on the room available, and it puts one minor interval tick mark between each pair of major intervals. In Figure 5.15, we left the major intervals



**Figure 5.15:** Changing the settings for manual scaling (Axis menu) may change the relationships being charted; here, the price rises don't seem as dramatic as they did in Figure 5.12.

in five-cent increments, but we changed the minor intervals to one-cent increments. You can set either or both of the interval selections and either or both of the maximum and minimum settings. If you delete your selections, Jazz will automatically set the values.

**Set (Axis) Labels** The Set Labels command uses the text or values that you've highlighted on a worksheet or database to label the intervals on the bottom axis, also called the text axis. Jazz uses one cell's contents to mark each data point along the bottom axis. If necessary, Jazz staggers the label entries to fit. If there's still not enough room, Jazz displays part of the entry, followed by three dots to indicate missing material. If you don't have enough room for labels, you might try abbreviating the labels on the highlighted worksheet. You could also reduce the number of data points you're plotting by selecting a portion of them or scaling them back.

Once you've labeled the bottom axis, this command changes to Clear Labels. You can only use the Set Labels command to insert a label on the bottom axis.

**Format Axis Labels** The Format command on the Axis menu offers you a selection of formats for the labels on the right and left axis. In Figure 5.15, we used Currency format, with two decimal places for the left axis and Percent format, with one decimal place for the right axis. Figure 5.16 shows the format options available.

Formats are discussed in more detail in Chapter 4 in the section about the Format command on the Range menu.

If you are using both right and left axes, you can format either or both of them by clicking the circle next to the desired axis. When formatting both axes, first format one, then with the dialog box still open, click the circle next to the other axis name and choose a format for it. Both formats will become effective when you click the OK box.

**The Font Menu** For the most part, the Font menu works in the graphics module in much the same manner that it works in the other modules. However, a graphics display contains many

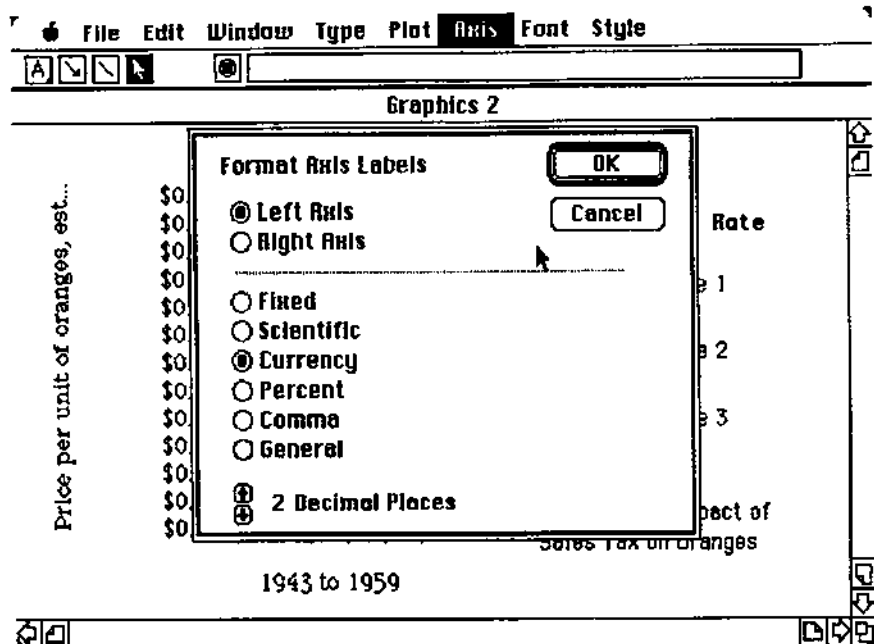


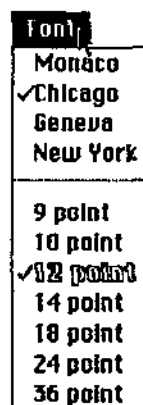
Figure 5.16: The format options in the Format Axis Labels dialog box.

elements that are not subject to the full range of font and style options. None of the plots, lines, or symbols are affected by a change in font or style, for example. Only text and values on the graph can be changed using the commands on the Font menu, shown in Figure 5.17.

**Changing Type Fonts and Sizes** When you select a different type font or size for a graph, all the axis labels and axis titles will change immediately to the new selections. You may find that changing the font or size enlarges labels or titles so much that they no longer fit in the room available. You can keep changing fonts and sizes until you find the right ones for the particular graph.

To change the fonts of the text inside a notation box or legend box, select the individual box, highlight the desired text, and select the font or style. Only the highlighted text will change. If you select the font and style before you enter text in the box, whatever you type will be in that font, size, and style. In either case, it's possible that changing fonts and sizes will make the text too large to fit in the box. You can either adjust the type font or size or make the box bigger.

**Selecting Fonts** As with all font selections on the Macintosh, each font name has recommended sizes, which are displayed in outline print. These sizes are recommended because your Macintosh has these sizes in memory, and can quickly and easily reproduce them. These sizes are smoothed and calculated so that they display



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**Figure 5.17:** The Font menu.

well. If you choose sizes that are not recommended, the resulting text will appear jagged and will be difficult to read because your Macintosh projects them from other sizes using an unsophisticated projecting algorithm. This seems particularly noticeable in graphics displays because they are typically highlighted with larger labels and stylized fonts.

Laser printers have stored fonts of their own. If you have a laser printer, it's a good idea to use fonts in your Jazz documents that correspond to fonts available on your printer. This will result in near typeset-quality printing. If you choose a font that's not available with the laser printer, the laser printer will either convert your font selection to one of its available fonts (with some drawbacks, such as slower printing speeds), or the printer may try to reproduce the chosen font in graphics mode, which is extremely slow and doesn't achieve typeset-quality results.

The Imagewriter, on the other hand, can print any font that a Macintosh can display.

**Style Menu** The Style menu, shown in Figure 5.18, offers typeface enhancements, which are available in the other Jazz modules, plus three groups of commands that are unique to the graphics module. These commands are for: altering the patterns

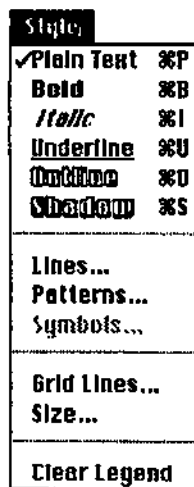


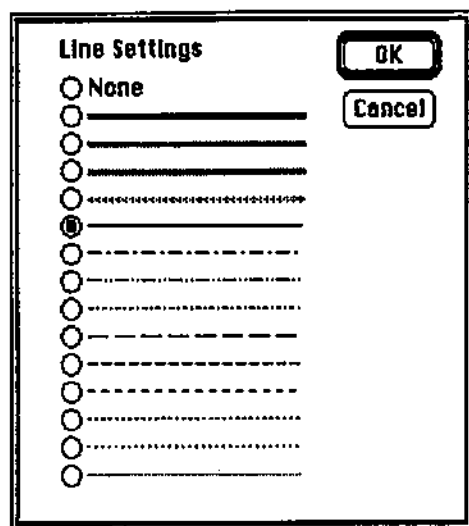
Figure 5.18: The Style menu.

used to display lines, bars, areas, and symbols; changing the size of the graphics display; inserting legends to explain the symbols used on a graph; and overlaying grid lines on a graph.

**Typeface Enhancements** Typeface enhancements, like type font and size selections, affect all axis labels and titles on a graph immediately. To use enhancements for notation box and legend box text, select the desired box, highlight the text to be altered, and select the enhancement. If you select the enhancement before entering text in the box, whatever you type will be in that style.

**Altering Lines, Patterns, and Symbols** The **Lines** command becomes active when you select a plot for any kind of graph that uses lines (for example, a line chart, a bar chart, or an area chart) or when you select a line or arrow that you drew using the line well or arrow well. (Select plots with the Plot Selector icon; select lines by clicking on them with the cursor.) Choosing the Lines command displays the Line Settings box shown in Figure 5.19.

The line type currently being used for the selected plot is indicated by a solid center in its circle. To switch to another line type, click on the circle next to it. It is possible to have two different plots that use the same line type.



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**Figure 5.19:** The Line Settings box.

The **Symbols** command becomes active when you select any plot that uses symbols to mark data points. You can then choose different symbols for your plot from the Symbol Settings box shown in Figure 5.20.

The active symbol is highlighted in this dialog box. To switch to another symbol, click on it, and the new symbol will mark the data points on the selected plot line. It is possible to have two plots that use the same symbol.

The **Patterns** command becomes active when you select any plot that uses patterns, such as bar charts and area charts, or when you select a legend box. The Pattern Settings box offers a choice of patterns, as shown in Figure 5.21.

The pattern currently used for the selected item on the graph is boxed in double lines. To select another pattern type, click on it, and the plot or legend box will use the new pattern.

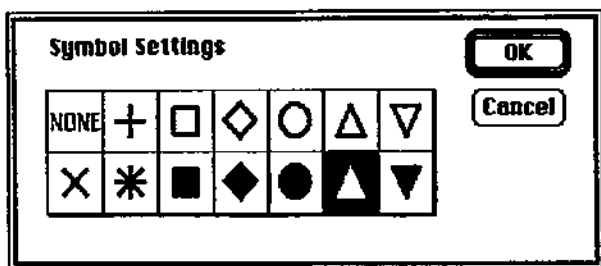


Figure 5.20: The Symbol Settings box.

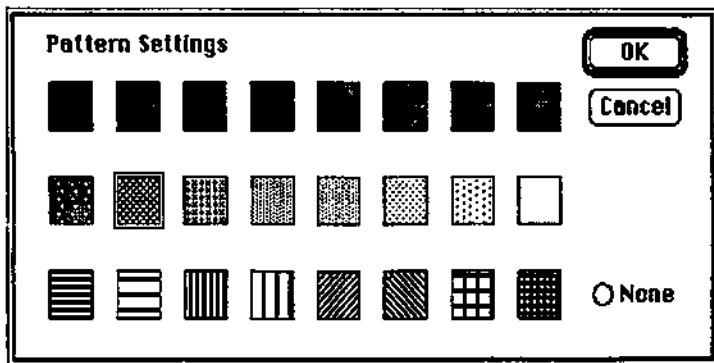


Figure 5.21: The Pattern Settings box.

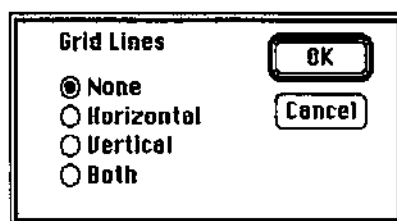
**Grid Lines** The Grid Lines command offers you a choice of types of grid lines. It displays the Grid Lines box shown in Figure 5.22.

Grid lines help show exactly where data points fall in a graph. You can choose horizontal lines to line up data points with the vertical axes or vertical lines to line up data points with the horizontal axes. You can choose both types of lines to create a grid pattern. The default setting is none; select it to eliminate grid lines.

Note that grid lines are overwritten by patterns that fill in an area and by the bars in bar graphs.

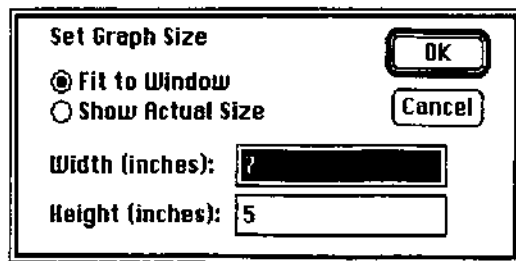
**Sizing The Graph** Selecting the Size command from the Style menu calls up the Set Graph Size box, shown in Figure 5.23.

Normally, graphs are sized to fit entirely within the window being displayed. If you change the size of the window, the graph is resized to fit inside the window's new dimensions. To avoid this, you can set a standard size for a graph (in inches) using the Set Graph Size box. Then, the graph will be displayed, and printed, full size instead of proportioned to fit inside the window. Even if you resize the window, the graph won't change its proportions.



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**Figure 5.22:** The Grid Lines box.



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**Figure 5.23:** The Set Graph Size box.



When you select the Show Actual Size option, the graph will be redrawn on the screen. If the window is too small, portions of the graph will no longer be visible.

If you print a graph that is too wide for the printer, you'll get as much of the graph as will fit on the printed page, and the rest will be truncated.

**Legend** The Legend command on the Style menu lets you select patterns and symbols to define the different plots on a graph. For example, if you have three line graph plots, each marked with its own data point symbol (say, a filled box, a plus sign, and an asterisk), you can label each plot line using the Set Legend command.

Choosing Set Legend inserts a legend for each plot on the graph. The corresponding symbol for each plot appears next to the box. A text-insert cursor blinks in one of the boxes. You can type in explanatory material, then select the next box and enter text, and continue until you've identified each plot. The legend boxes can be sized and moved, and you can change the font, size, and style of the text inside.

When you select a legend box, the Duplicate Notation command on the Edit menu becomes active. You can select this command to create a duplicate of the box and its text, but it will not duplicate the accompanying symbol.

When the legends are set, the command becomes Clear Legends. This command deletes any text in the legend boxes.

**Working with Other Jazz Modules** The Jazz graphics module uses data from the worksheet and database modules, and you can send the results to a word processor document.

**Working with the Worksheet and Database Modules** A graph is always linked to the worksheet or database on which it is based. Thus, removing a linked worksheet or database from the disk will make it difficult and sometimes impossible to open the graphics file. You will receive a warning message that says that the worksheet to which the file is connected is no longer available, and you can associate it instead with another worksheet.

**Working with the Word Processor** There are two methods of transferring graphics to a word processor document: by using the traditional copy and paste method or by using the HotView feature.

Putting graphics into a word processor document is simple. Graphics displays can only be dealt with as a whole; there are no ranges to consider, no rows and columns to highlight. There is only one selection command available on the Edit menu: Select All. Click this command, and a box surrounds the entire graphics display.

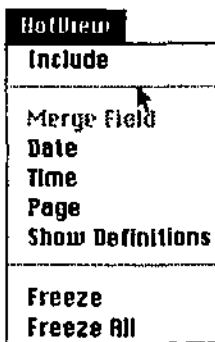
Now the Copy and Clear commands are active. Clear will empty the Graphics window. Copy copies the graphics display into the Clipboard.

Once you have selected and copied the graph, open the Word Processor window in which you want to insert it.

Next, you must decide whether you want to paste the graph or make it a HotView. The HotView feature inserts a copy that is still linked to the original Graphics window. If you change anything in the Graphics window, that change will immediately be reflected in the word processor document. The HotView feature lets you use temporary graphics, confident that they will be updated automatically.

On the other hand, when you use the Paste command, you insert a fixed copy—changes in the Graphics window will not affect the word processor's graphics display. There is no other immediately visible difference between using Paste and using a HotView.

To use either method, start by moving the cursor down to the position in the word processor document where you want the graphics display to begin. Then select Paste on the Edit menu or Include on the HotView menu, shown in Figure 5.24. The selected Graphics window will be pasted into the word processor.



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**Figure 5.24:** Use the Include command on the HotView menu to copy a graphic display into a word processor document.

Jazz considers the inserted graphics display as an integral unit that is not subject to the usual rules of word processing. When it comes time to print this file, the printer will switch from text mode to graphics mode when it encounters the graphics portion of the file.

When the graph is first transferred to the word processing file, it's surrounded by a box. To turn off the box, click the cursor anywhere above or below the graphics display area.

Although the box is gone, the graph is still isolated from the rest of the text. You can't write in the graphics box or on either side of it. The only way you can highlight it is by dragging the cursor across it and highlighting the entire box at once. You can then cut, copy, paste, or clear it. You can activate the box and drag the graph to a new location, and you can size it on the page. However, you can't change fonts, style, or size, or edit anything within the graphics display itself.

The graph is unaffected by margin settings or tab settings. If a page break would break up the graph, the entire display moves down to the next page.

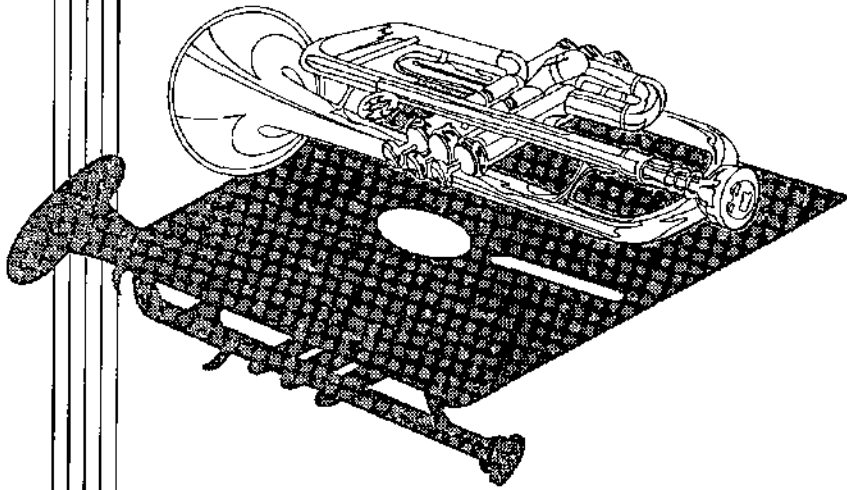
If you used the HotView feature, you can later "freeze" the graphics display, which will sever its connection to the Graphics window. The graph is then an ordinary paste-style graphics display. There is no visible change, but changes in the Graphics window are no longer reflected in the word processing file.

You can also use the Freeze All command, which will freeze any HotViews in the active window.

See Chapter 6 for more information about including graphic displays in a word processor document.

**S***ummary* The Jazz graphics module makes it easy to create a graphics displays, ranging from simple charts to sophisticated multiple plots. Because Jazz takes full advantage of the graphics and printing capabilities of the Macintosh, you can produce quality graphics rivalling the work of professional graphics houses. And, they require less work than sketching out a chart and trying to explain it to someone else. Jazz graphics—produced on the spot from original data—are likely to be more accurate than those produced manually, and the ease of creating them offers more opportunities for quick visual analysis of complex data relationships.

The next chapter deals with the Jazz word processor module, where the results of the database, worksheet, and graphics modules are often integrated.



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# ***WORD PROCESSING***

# 6

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**INTRODUCTION** Jazz's word processor is an essential tool for business correspondence and reports. It is simple to learn, easy to use, and flexible enough for most applications.

The word processor includes most of the features available in professional word processing programs. You can set tabs and margins, arrange text format, and make columnar tables.

Furthermore, the word processor is the module that ties all the others together. You can cut and paste information from other documents into word processor text, and you can use the special HotView feature to link the word processor directly to a Database, Worksheet, or Graphics window. This means that HotViews in your word processor documents will be updated whenever you make a change in the associated windows in the other modules. In this way, you can produce an up-to-date report that combines elements from many other modules.

# **E** XECUTIVE REPORT

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## WORD PROCESSING SAMPLE PAGE

### **(A)** MEMORANDUM

From: J. Widge **(B)**  
To: All Widgeco Salespeople  
Date: July 26, 1985 **(C)**  
Subject: Regional Sales Performance Report

In an effort to evaluate quotas and increase sales productivity, Widgeco **(D)** traditionally reviews its salespeople's performance in the middle of each calendar year.

As a part of this analysis, we have attached the following documents:

- (E)** - A chart comparing the performance of all 50 Widgeco salespeople.
- A table analyzing the sales by region.
- Graphs showing the sales volume of the salespeople in each of the five regions.

In general, these sales figures are very encouraging. While this document obviously shows that there is still room for improvement, we feel there is clear reason for optimism.

Thank you all for your contributions. See you at the meeting August 14.

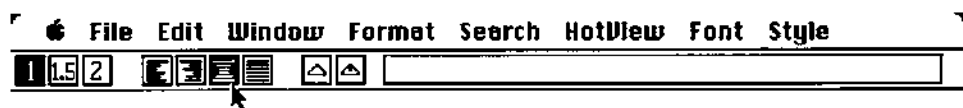
## **K** KEY TO THE SAMPLE PAGE

The document on the facing page is the cover memorandum for the executive report described in Chapter 8. It incorporates the following special elements:

- Ⓐ The word memorandum is printed in a larger type size than the rest of the text. It is set off with boldface and centered at the top of the page.
- Ⓑ The memo head uses a tab stop to line up four items in a column.
- Ⓒ The date is inserted as a HotView, so that it shows the current date from the Macintosh's system clock. The actual memo will show the date when it was actually printed and sent out.
- Ⓓ The text of the memo is printed with full justification, so that both the left and right margins line up.
- Ⓔ The memo includes an indented list that uses special margin settings to indent each item and further indent runover lines.

## CREATING THE SAMPLE PAGE

To start creating the cover letter for the executive report, choose the Center icon on the console line.



Choose 14 point from the Font menu and Bold from the Style menu. Then type the word

### MEMORANDUM

into the text. It should come out in large text at the top of the document window. Change to 12-point font and Plain Style, so that the text that follows is printed in smaller type.

Next, choose Insert Ruler from the Format menu. Drag the small triangle (the tab marker) that represents the first tab stop from its initial position at the 1½-inch mark out to the 1¾-inch mark on the ruler. Also, click the Left icon so that the text will be aligned along the left margin rather than centered. Type:

From:

Press the Tab key and type the rest of the first line:

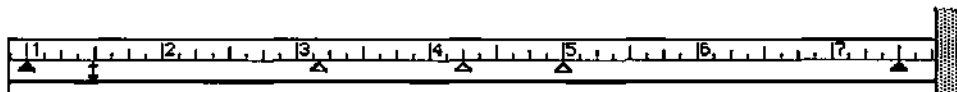
J. Widge

The name will be lined up under the tab marker. Do the same for the other lines of the memo head.

Choose Insert Ruler again and click the Full Justification icon. Type the text down to the point where the indented list begins. Don't press Return at the end of each line because Jazz automatically starts a new line when it runs out of room. Press Return only at the end of each paragraph.

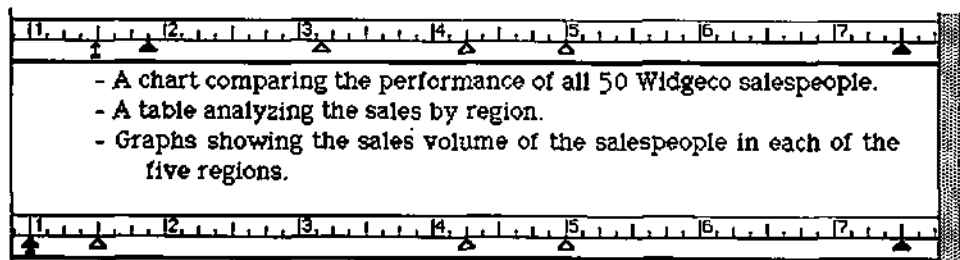
When you reach the list, choose Insert Ruler to create yet another ruler line. This time, move the tab markers out of the way to the right and move the solid black marker that sets the left margin. The first time you drag this marker, you'll pick up a thin arrow marker, which you'll use to set the left margin of the first line of each item. Move this marker to the 1½-inch mark, as shown in Figure 6R.1.





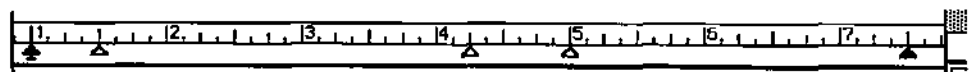
**Figure 6R.1: Moving the arrow marker.**

Then move the solid black triangle out to the  $1\frac{7}{8}$ -inch mark to mark the left margin of each succeeding line in each item. Since this marker is to the right of the first line, it creates a hanging indent, as in Figure 6R.2.



**Figure 6R.2: Creating a hanging indent.**

At the end of the list, choose Insert Ruler again to restore the initial ruler line for the remainder of the text. Move the tab and margin markers back to their original positions, as in Figure 6R.3.



**Figure 6R.3: Restoring the initial ruler line.**

With the cover letter finished, you can go on and create the other pages of the report using the Cut and Paste commands and the HotView feature to move information from database, worksheet, and graphics documents.



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**U**sing the Word Processor The Jazz word processor is fairly simple and easy to learn, but beneath that simplicity, you'll find a program that has all the functions that you'll need for business correspondence. And, if you link it with Jazz's database, worksheet, and graphics applications, you can produce fancy reports that any boss would commend.

When you open a word-processor document, you see a screen like the one in Figure 6.1. The top of the screen shows the word processor console, which has icons for formatting text on the printed page.

The document window is empty, except for the ruler line at the top. This line shows information about the document. It measures the left and right margins and the tab stops that arrange columns in tables. The tick marks are in inches, measured from the left edge of the printed page. The left margin is indicated by a black triangle under the 1-inch mark; the right margin is set by another marker at 7½ inches, out past the right edge of the window.

The Jazz word processor follows the rule "What you see is what you get." Jazz constantly rearranges the screen to match what it will

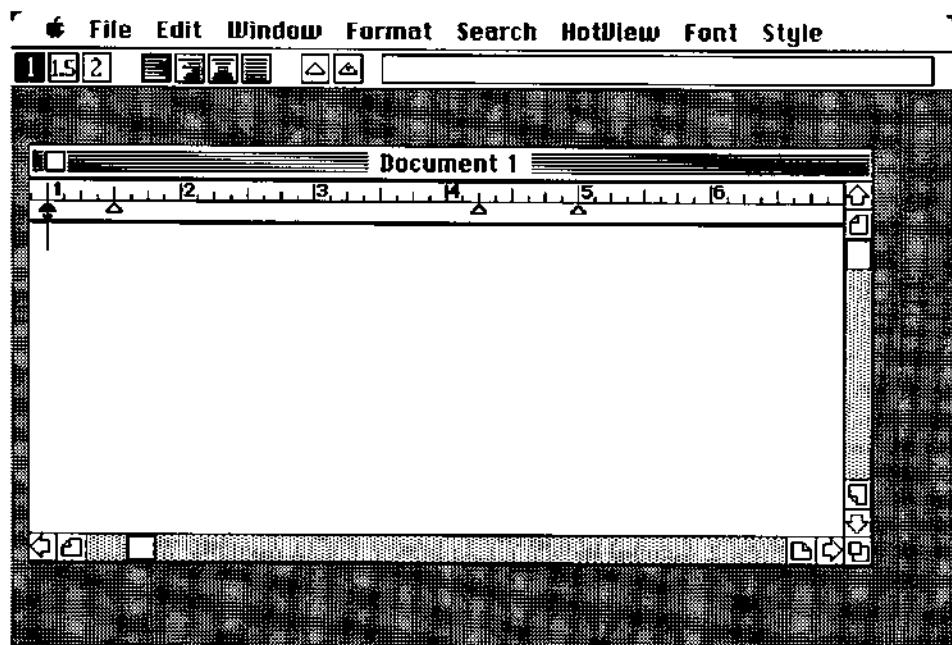


Figure 6.1: A word-processor document window.

print on paper. The only exceptions are the ruler lines, which are not printed. Later in this chapter, you'll learn how to hide the ruler lines so that they don't interfere with the screen display.

Like the other parts of Jazz, the word processor has File and Window menus that let you do basic operations. From the File menu, you can open other documents, save your text, print, and quit Jazz entirely. From the Window menu, you can switch quickly to other Jazz documents, look at the Clipboard, and call up the Reference Board.

The Zoom Up command on the Window menu is particularly useful in the word processor because it expands the window so that you can see the entire width of lines. If you don't enlarge the window, the right ends of each line will be hidden on the screen. (They are still printed, of course.)

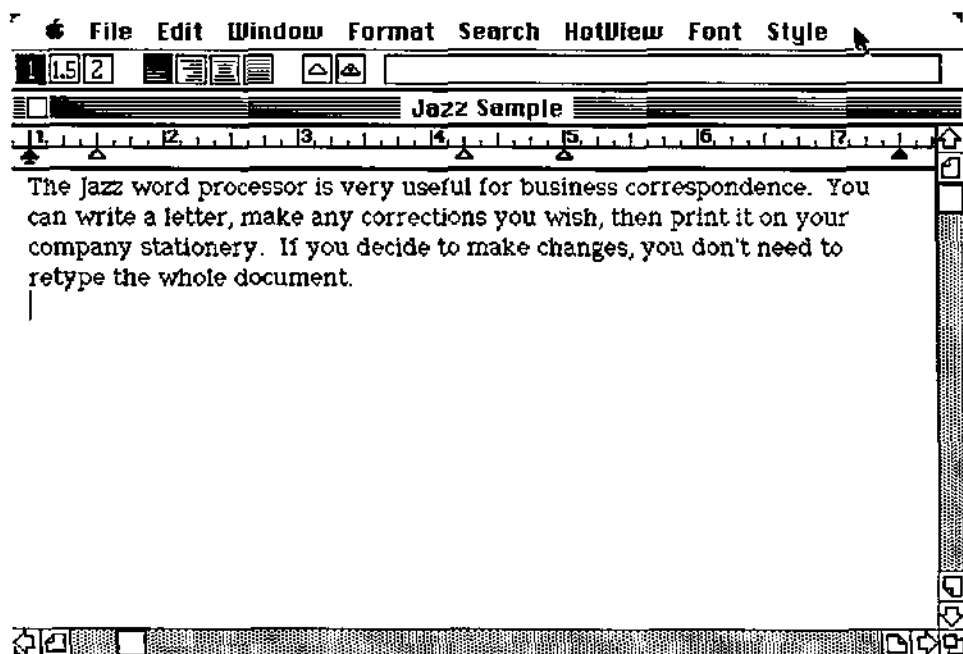
**Basic Editing** The word processor is based on the text editing commands that you have been using throughout Jazz. Whenever you typed or edited text inside a box in the spreadsheet or database application, you were doing the same thing you'll be doing in the word processor. You therefore have a good jump on the word processor. All you have to do is master the fancier features of text formatting.

In the word processor, you type just as you would on a typewriter. There's only one big difference: you don't press Return when you reach the end of a line. Instead, you keep typing and let the computer pull the word down to the next line when it reaches the right margin. This is called word wrap, and it's one of the most important features of a word processor.

The Return key is reserved for ending a paragraph. At that point, you want to start a new line, whether or not your word has reached the right edge of the screen. The Return key inserts a hard carriage return, an invisible character that forces the program to begin a new line. The insertion point skips down to that new line to await the first word in the next paragraph, as shown in Figure 6.2.

If you make a mistake while you're typing, don't worry. Press the Backspace key, just as you did when you made a mistake while you were typing a spreadsheet or database cell. The insertion point moves one character backward and erases your mistake. You can then type a new character.

If you move the mouse and click somewhere in the text you have typed, the insertion point will move back to that point. If you type



**Figure 6.2:** A paragraph in the jazz word processor.

another letter, it will appear there in the middle of your text, rather than at the end. This means that you can insert text anywhere you want. If you forget a sentence in the middle of the paragraph, you can just click the mouse at the place where you want it and type your new text.

As you insert text within a paragraph, Jazz reformats the rest of the paragraph by moving the words around so that the paragraph fits neatly between the margins. When you're finished, the text looks as if you typed the new sentence when you first typed the paragraph. Jazz does this reformatting automatically while you type. Figure 6.3 shows a sentence inserted in the middle of this sample text.

Jazz considers each paragraph as a single, unbroken stream of text. Each carriage return starts a new reformatting unit.

If, for some reason, you had been pressing Return at the end of each line, Jazz would treat each line as if it were a separate paragraph. If you insert text, the words in that line will be reformatted, but the lines below will not be wrapped to fit. You might then have a display like the one in Figure 6.4, in which the next to the last line is too short for the margins.

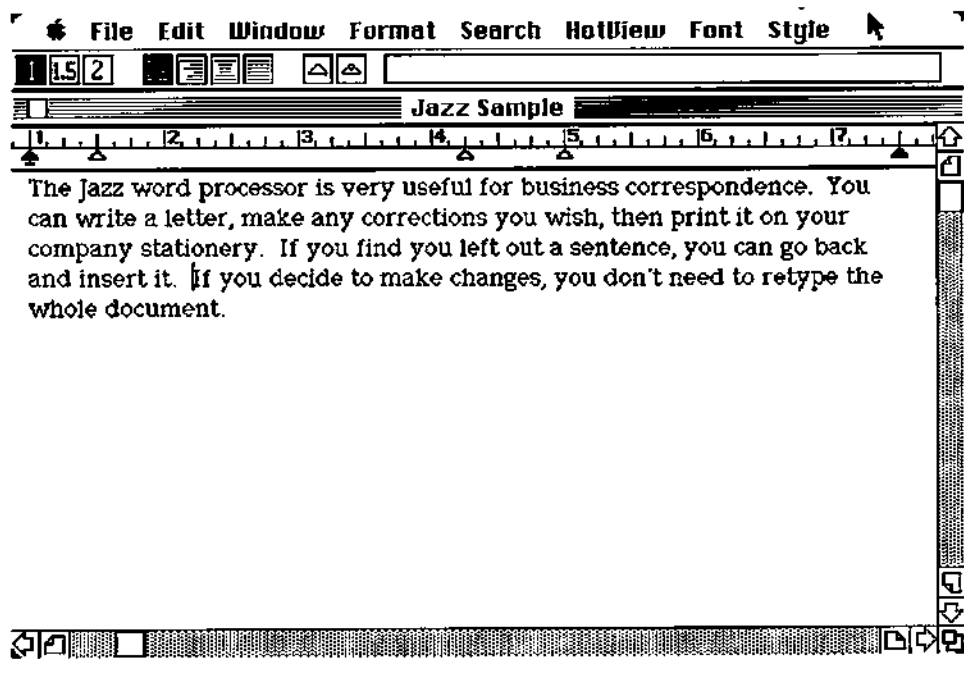
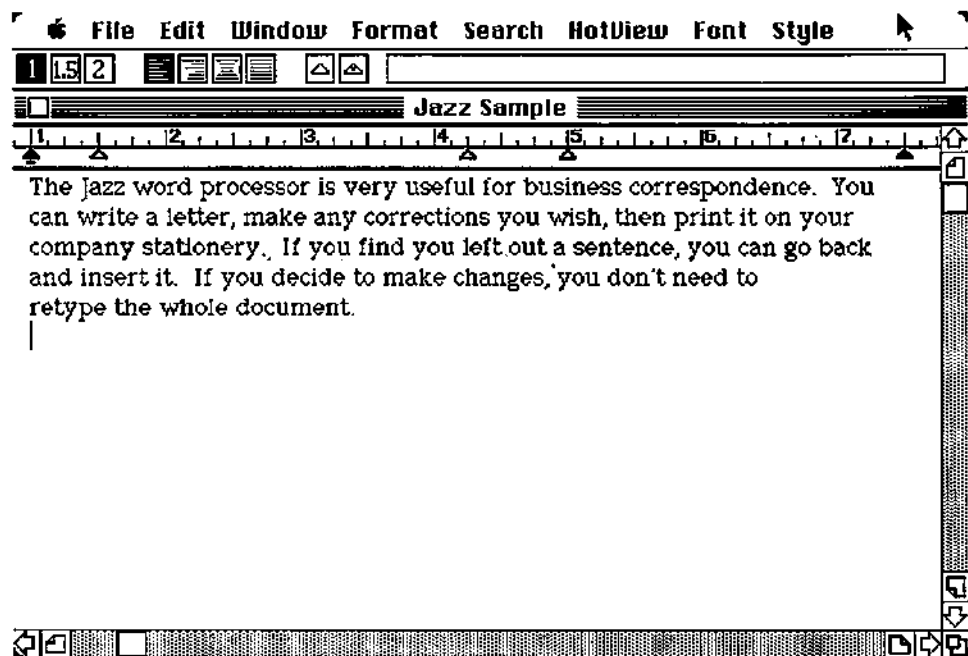


Figure 6.3: Inserting a sentence in the middle of a paragraph.

**Marking Blocks** The word processor lets you use the mouse to mark blocks of text that you want to cut, copy, or move. When you mark a block, the text is highlighted. The highlighted text is the unit that is affected by the Cut, Copy, and Paste commands on the Edit menu.

You can mark a single word as a block by double-clicking it. A double click is required because a single click would merely deposit the insertion point in the middle of the word. (You can see this happen briefly if you watch carefully while you double-click.)

You can mark a block of text by dragging the mouse. Press the button down at the point where you want the block to begin. Then hold the button down and drag the mouse to the end of the block. As you drag, the highlighting expands to show what you are marking. When you're satisfied, release the button to make the highlighting permanent. Figure 6.5 shows a sentence highlighted in this way.



**Figure 6.4:** Insertions are reformatted incorrectly if you type carriage returns at the ends of lines.

Once you have marked a block, you can do a variety of things with it: you can replace it, delete it, and cut or copy it to the Clipboard. When you cut or copy a block, you can then paste it in another place.

The simplest operation is just to replace a block with something else. To do that, first mark the block, then type the new text. As you type the first letter, the highlighting disappears, and the remainder of the paragraph closes up around the spot. The insertion point reappears after that first letter, and you can continue typing the rest of your insertion.

Deleting a block is just as easy. Just press the Backspace key or choose Clear from the Edit menu. The first time you press Backspace on a marked block, it deletes the block. Then, since the block has been removed and the insertion point has reappeared, Backspace goes back to its original function of deleting the character to the left of the insertion point.

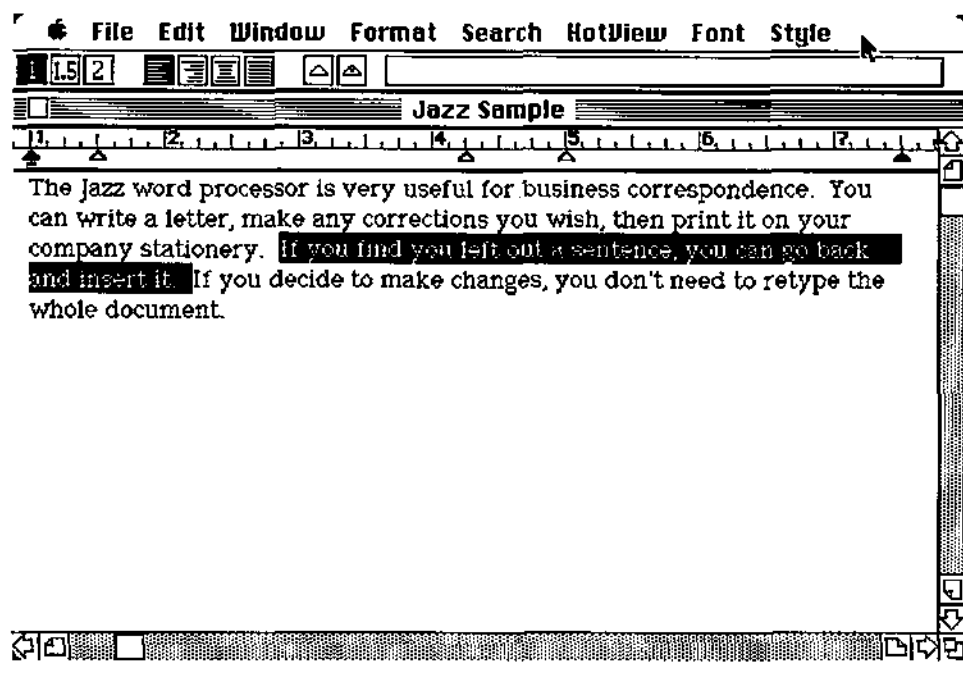


Figure 6.5: Marking a sentence.

Just after you replace or delete a block, you can go back and restore it with the Undo Typing command on the Edit menu (Undo Clear if you deleted the block with the Clear command). Undo Typing removes any new text that you may have typed to replace the block and restores the block to its state before the deletion. This command is particularly useful in cases where you mark a block, then press a key by mistake. Without Undo, you would permanently lose the text you mistakenly typed over.

As in the other Jazz applications, you must use Undo immediately after the mistake you want to reverse. If you move the insertion point or use any other command, you will no longer be able to undo the change. Remember also that you can speed up the program by eliminating the Undo command, with the Disable Undo option on the Apple menu.

**Cut and Paste** As in the other Jazz applications, the Cut and Paste commands let you remove part of your text and insert it in



another place. By combining this pair of commands, you can move or duplicate large chunks of text.

Cut deletes the text from the paragraph and puts it on the Clipboard, just as in the database and spreadsheet applications. In those applications, however, Cut left blank cells in the table. In the word processor, the text disappears and the paragraph closes up around the space.

You can, in fact, use Cut to delete a block. The text appears on the Clipboard, but it doesn't appear in your text unless you use the Paste command to put it back in. The only problem with using Cut to delete is that the deleted text replaces whatever was previously on the Clipboard. Since there are times when you won't want to lose what's on the Clipboard, you should get in the habit of using Clear or Backspace to delete text.

You can move a block by cutting it and then pasting it back in another place. Click the mouse on the point where you want to move the block. Then choose Paste from the Edit menu. The text splits apart at the insertion point, and the block reappears there. Paste leaves the insertion point after the last character in the inserted block.

You can, of course, paste the block back in at its previous position. So, if you cut a block by mistake, just paste it back where it was. You can also achieve the same result immediately after the mistake by choosing Undo Cut from the Edit menu.

A companion command to Cut is Copy, which moves a copy of the block to the Clipboard while leaving the original block in the text. Use Copy when you want to duplicate a block of text rather than lifting it out and moving it somewhere else. Just choose Copy from the Edit menu, then use Paste to put the block into the text at the place where you want the duplicate to appear.

You can use Paste as many times as you want—the text remains on the Clipboard until you cut or copy something else. By using the Paste command repeatedly, you can produce multiple copies, as in Figure 6.6.

Be careful of how you mark the block that you want to move. Cut and Paste move spaces at the beginning and end of the block just as you mark them. If you're moving a full word, mark only one of the two spaces on either side, then move the insertion point to the side of the space where you want to paste it. If you don't do this, you may find you leave an extra space or no space between the words at the point where you cut your text or at the place where you pasted it.

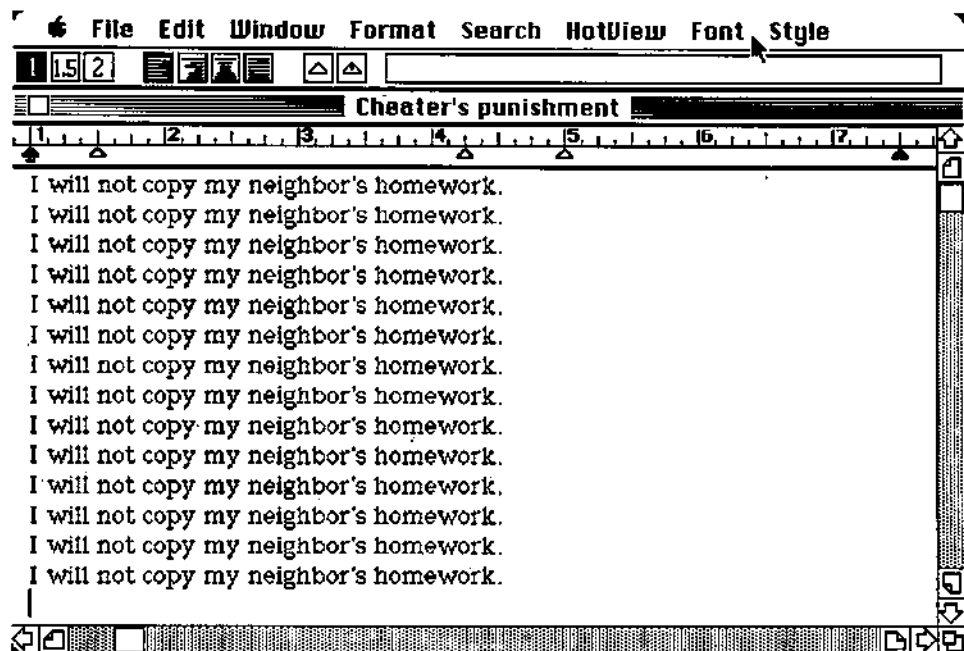


Figure 6.6: You can paste multiple copies of a single block into your text.

Hard carriage returns are also tricky if you're moving full paragraphs. Remember that each paragraph ends with an invisible carriage return, which you inserted by pressing Return. If you want to move an entire paragraph, mark the block beginning at the left margin of the paragraph you are removing and ending at the left margin of the next paragraph. This way you will leave behind the carriage return that ends the previous paragraph and take the carriage return that ends the one that you are moving. When you paste the paragraph back into the text, insert it after the carriage return of the paragraph that you want the inserted paragraph to follow. If you include the carriage return ending the previous paragraph in the block as well as the one that you are moving, when you move the block, the paragraphs above and below it will merge to form one paragraph. At times, you may not want to carry the carriage return with you—for example, if you wanted to produce the paragraph in Figure 6.7.

Don't be too concerned about the finer points of marking blocks. You'll learn the tricks as you work. And, if you occasionally end up



**Search and Replace** Another useful word processing feature is the Search menu, which lets you find every occurrence of a series of characters in your text. You can use this menu to find the places where the characters appear, and you can have Jazz automatically replace them with another series.

Say you want to find every occurrence of the word *Jazz* in a text. You would start by choosing Find . . . from the Search menu. A dialog box will appear, like the one shown in Figure 6.8.

Inside the dialog box, or Find window, the insertion point is flashing next to the word Find. Type the string of characters that you want to find. The string can be anything: a word, several words separated by spaces, or even just a series of characters inside a word. The only requirement is that it must match exactly the series of characters you want to find. If you misspell a word or type an extra space between two words, the Find command will not be able to match the text.

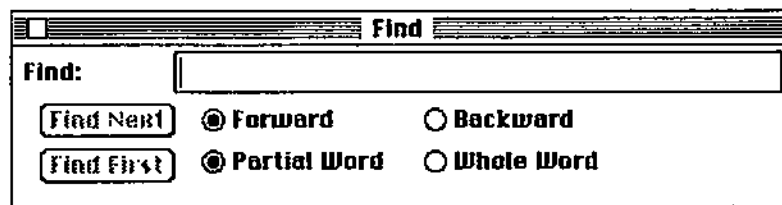
In this example, you might type the word

**Jazz**

then press one of the two buttons on the left side of the box: Find Next or Find First. Find Next searches through your document from the current position of the insertion point. Find First goes to the first occurrence starting from the beginning of the document.

If you want to find all the occurrences of a word, you'll want to start by clicking Find First. Then you can use Find Next to find each of the successive occurrences. Alternatively, you can move the insertion point to the beginning of the text before choosing Find.

Figure 6.9 shows what happens when you choose the Find First button. The program highlights the first place where it finds the series of letters. If you then choose Find Next, the program moves the highlighting to the next occurrence of the string.



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**Figure 6.8:** The Find dialog box.

If you choose Find Next and your insertion point was after the last occurrence, the program beeps and displays an error box with the message

Text 'Jazz' cannot be found.

You might find this confusing if this is the first time you choose Find Next with the text because you know the string is somewhere in your document. Just remember that Find searches only the part of your document that lies between the insertion point and the end. Use Find First to get back to the first occurrence.

Like all dialog boxes, the Find window opens up right on top of your text. When you choose Find First to start your search, the first occurrence the program finds may be hidden beneath the Find box. If this is the case, you may think that nothing has happened. Just drag the Find box to another place so that you can see the highlighted text. The Find box in Figure 6.9 has been moved for this reason.

The Find box offers a number of options that let you search in other ways. You can, for example, click the Backward button if you

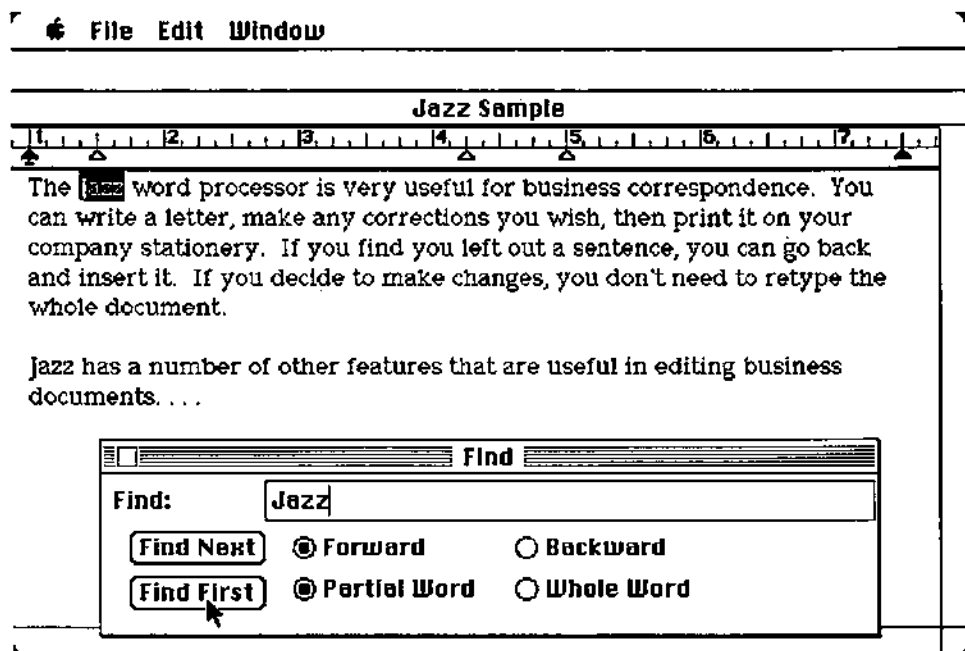


Figure 6.9: The Find command highlights each occurrence of the string with a black box.

want to search from the end of your document back to the beginning. If you do this, the Find Next and Find First buttons change to Find Prev and Find Last to show that you are searching backwards from the insertion point.

The other option, Whole Word, is useful for weeding out false hits on short words. If you were searching for the word *in*, for example, you wouldn't want to be bothered with words like *win*, *print*, and *running*—all of which contain the characters *in*. By choosing the Whole Word option, you can get only the matches you want.

Jazz's Search options ignore all differences between capital and lowercase letters. As far as the program is concerned, the strings *Jazz*, *JAZZ*, and *jaZZ* are identical. This can lead to some false hits if you're only looking for one specific form, but it makes sure you catch all occurrences (as when the word appears at the beginning of a sentence).

When you're done searching, click the close box at the upper-left corner of the Find window, or click somewhere in your document window. The Find window will disappear, and you can go back to editing.

Even after you close the Find window, you can repeat the last search by choosing Find Next from the Search menu (or its command-key equivalent, Command-F). Find Next is a quick way of repeating a search without opening up a window. Since it does not need to have the Find window on the screen, the Find Next command also eliminates the problem of the Find window covering up parts of your text. If you chose the Backwards option in your last search, the menu option is Find Prev.

The fancier part of the Search menu is Replace, which lets you automatically change the string to something else. You can change the string either selectively at certain places only or globally throughout your document.

When you choose Replace from the Search menu, another dialog box appears, as shown in Figure 6.10. This box resembles the Find window, but it includes some additional features.

The first thing that's new about Replace is that you have to fill in two different boxes. The first, Find, is the same as in the Find window. Here you fill in the string of characters that you want to locate in the text. In fact, if you have previously used the Find command, the text from that search will still be displayed in the box. You can edit this phrase or use it again. If you want to find a completely new string, drag the mouse across the old text, then type your new text. It will replace the old, just as it would a marked block in the document.

The second box, labeled **Change to**, is where you type the new version of the string. If, for example, you wanted to change *Jazz* to *Jazz program*, you would type **Jazz** in the upper box and **Jazz program** in the lower.

You don't have to type anything in the second box. If you type nothing, the command will replace the first string with no characters, deleting it altogether. This is a quick way to delete a word or phrase everywhere it occurs in your document.

You can replace text in two different ways. If you want to replace just some occurrences of the string, you should start by choosing **Find First** or **Find Next** as you did with the **Find** command. The program will jump directly to the place where it first finds the string and will highlight it in the text.

Once you've found the item, you have three choices:

- **Find Next** leaves the text unchanged and skips on to the next occurrence, just as it would with the **Find** command.
- **Change, then Find** replaces the marked text with the new version, then skips to the next occurrence.
- **Change** replaces that occurrence only, and stops searching.

The other way to use **Replace** is to click the **Change All** button. This tells the program to search through your entire text and replace the string every time it finds it.

When you choose the **Change All** option, *Jazz* displays a dialog box warning you that

**Change all is not Undo-able!!!**

This is just to remind you that you're about to perform an operation that may radically change your document. Click **OK** if you want to

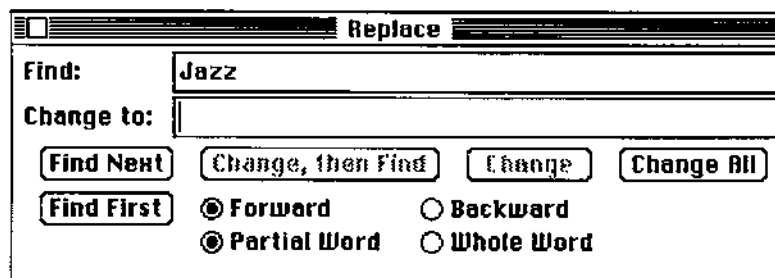


Figure 6.10: The **Replace** dialog box.

go ahead, or click Cancel if you have second thoughts. Once you've clicked OK, you cannot stop the operation, even if you see it making a mess of your document.

Actually, you can't undo any Replace operation. With individual replacements, however, the problem is not as serious; you will destroy at most one copy of the string for each click. At worst, you might have to go back and retype the string. If you make a mistake with Change All, however, you might make your document unreadable with a single step.

Change All can be handy, but you should use it with care. Save your document before you do this so that you can revert to that version if you make a mistake. Also, if you're replacing a word, choose the Whole Word option so that you won't create a monster if the word's letters happen to appear inside another word.

If you want to replace a string with several different replacements, you might be better off using Find rather than Replace. Set up the Find box with the string you want to replace. Then close the box and choose Find Next from the Search menu (or use Command-F from the keyboard). When the Find command highlights the string, you can replace it merely by typing over it. Then repeat the Find Next command. At the next occurrence of the string, you can type over with a different replacement.

Figure 6.11 shows a common example of this. This text uses hyphens to introduce each item in the list. If you want to change the hyphens to numbers, you can't conveniently use Replace because you want to give a different number for to each item.

Use Find instead. Search for the hyphen. When the program highlights the first occurrence, type

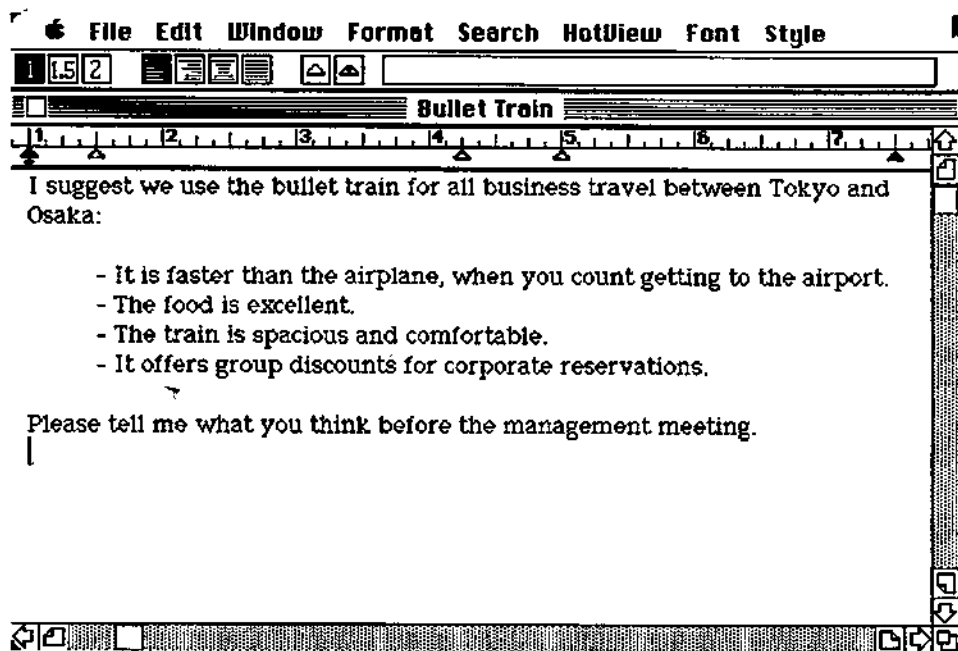
1.

The number will replace the hyphen. Search again and replace each hyphen with another number. You will quickly have the numbered list you want.

**The Font and Style Menus** One of the great attractions of the Jazz word processor is its ability to print text in different fonts, sizes, and type styles. The commands for changing these features are grouped on the Font and Style menus.

The Font and Style menus are available throughout Jazz, but the options are more flexible in the word processor. You can choose any





**Figure 6.11:** Use *Find*, rather than *Replace*, to change this bulleted list into a numbered list.

font or style anywhere in your text, and you can mix fonts and styles within a paragraph.

**What Fonts Are Available?** Five fonts are listed on the Font menu. These fonts are suited to a variety of purposes, as illustrated in Figure 6.12.

The word processor's default font is 12-point New York. (The other applications use 10- or 12-point Geneva as their default font.) New York was chosen for the word processor because it closely resembles the Times-Roman font, which is used for the text of many newspapers and books.

Geneva is another important font for text. It has a somewhat more modern look than New York. Use Geneva if you want your text to match text that you're pasting directly from the database or spreadsheet.

The Chicago and Venice fonts are for more special purposes. Chicago is the font that the Macintosh uses for all menu bars and system messages; you can use it as an additional 12-point font.

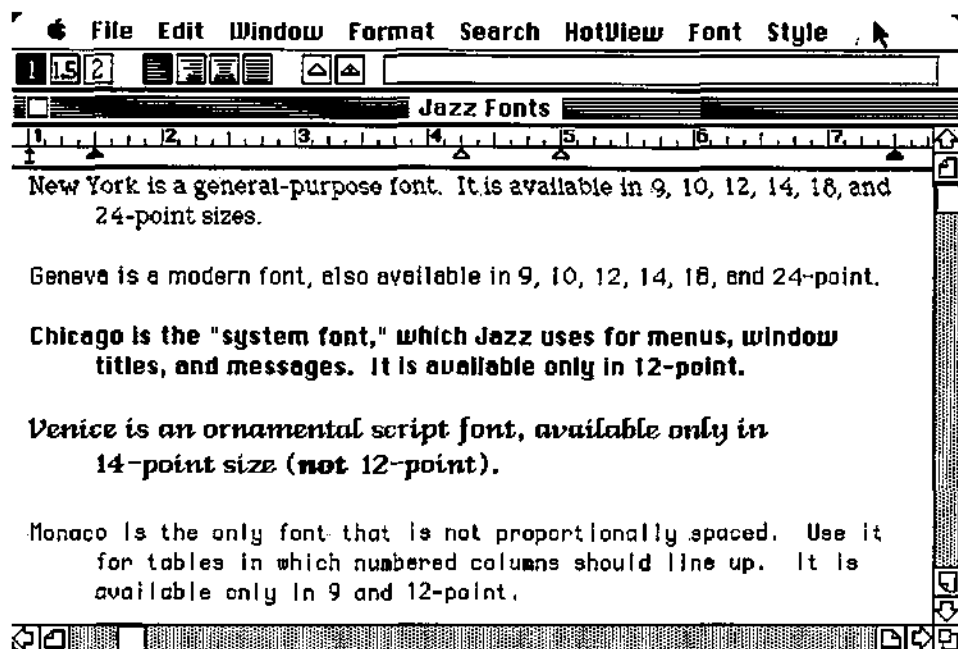


Figure 6.12: The fonts on the Jazz Font menu.

Venice is a 14-point script font, which is useful for ornamental text.

All the fonts except Monaco are proportionally spaced. In the proportional fonts, some letters occupy a wider space than others; the *i* in *thin* is narrower than the *w* in *wide*. This proportional spacing makes for more attractive text, but it can cause problems when you want columns of letters to line up vertically.

The Monaco font avoids this problem by using a fixed width for each letter. Monaco is not as attractive as the other fonts for standard text, but using it assures that vertical columns of letters will line up on the page.

These five fonts are not the only ones that you can use with Jazz. You can add other Macintosh fonts to your Jazz startup disk, using the Font Mover utility on your Macintosh system disk. Jazz will automatically include these other fonts on the Font menu if it finds them on the startup disk.

**Font Sizes** The Font menu also has choices for font sizes, so that you can select different sizes of type.

Font sizes are measured in points, a typesetting unit of roughly 1/72 inch. The point-size measures the distance from the bottom of the characters on one line to the bottom of the characters on the next. A 12-point font will therefore have lines every 1/6 inch. The actual characters are somewhat shorter because the measurement includes the space between the lines.

Not all fonts look good in all sizes. Jazz can produce 9-, 10-, 12-, 14-, 18-, 24-, and 36-point sizes for all the fonts on the menu, but it has actual character images on the disk in only some of those sizes. Available sizes are highlighted as outlined letters on the Font menu.

To produce the sizes it does not have on the disk, the Macintosh calculates a scaled image of another size of that font. If you ask for a size that is an exact multiple of an existing size, the scaling looks pretty good. If you ask for a size that is not an even multiple, however, the scaling usually looks uneven. The Venice font, for example, is not stored in 12-point. If you ask for that size, the Macintosh scales down the 14-point size, which leads to poor results.

If you're planning to use the high-quality printing on the Imagewriter printer, you should choose a font that has a size twice the size you are using. The Imagewriter uses this double size to print characters with twice the normal resolution.

See your Macintosh and printer manuals for more information about fonts and sizes.

**Type Styles** The Style menu lets you choose the alternate type styles of boldface, italics, underline, outline, and shadow. You can use these styles either independently or in combination with each other. Figure 6.13 shows some of the possible combinations.

You can choose as many options as you want from the Style menu. A check mark appears next to each item as you choose it. If you choose the item again, the option is turned off, and the check mark disappears.

The command-key equivalents on this menu are handy because they let you choose type style options without taking your hands off the keyboard:

|           |            |
|-----------|------------|
| Command-P | Plain text |
| Command-B | Bold       |
| Command-I | Italic     |
| Command-U | Underline  |
| Command-O | Outline    |
| Command-S | Shadow     |

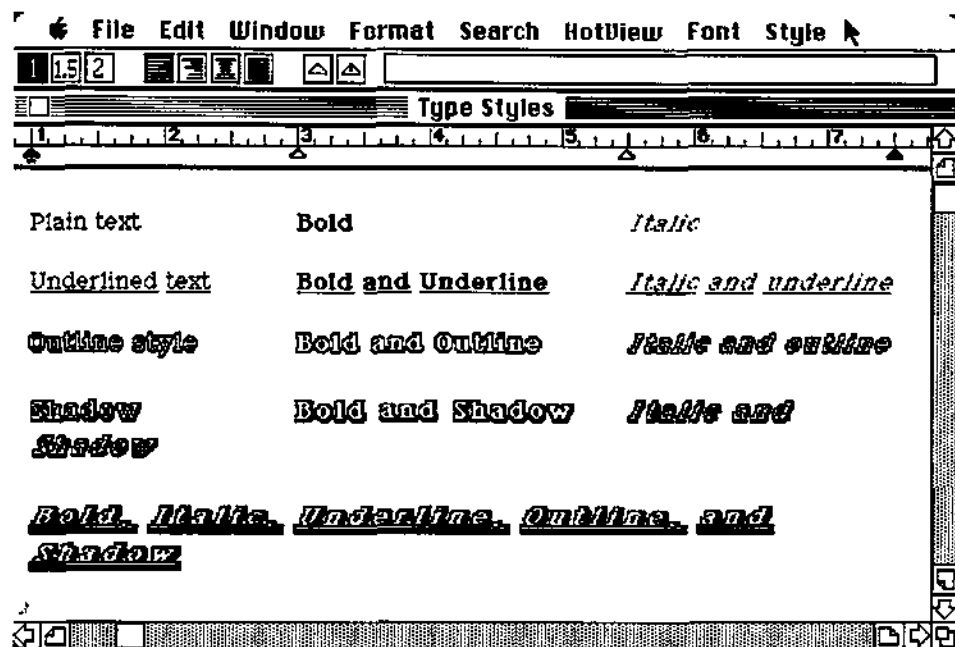


Figure 6.13: Some of the possible combinations of type styles (New York font).

If you want to type a single boldfaced word, press Command-B, type the word, then press Command-B again to turn the option off.

The Plain Text style is actually the absence of any other option. It turns off all other options and leaves a check mark only next to itself. When setting a new combination of options, you may want to choose Plain Text first to clear away any old options you may have set.

**Setting the Font and Style** As a general rule, each chunk of text has a font and style associated with it. You can either set the font and style as you type, or you can go back and change them later.

If you choose an option from the Font or Style menu while you are typing, it affects everything from that point on. If you move the insertion point back into a previous paragraph that is marked with a different font and type something in, the insertion will conform to the font of the existing text unless you specifically choose another font. If you move the insertion point forward to where you marked the new font, the text will be in that new font.

The other way to change a font or style is to go back later and apply a new font to a block. To do this, mark a block by dragging the mouse across it, then choose the font or style option. Your choice will affect all the text inside the block.

When you apply a new font or style to a block, it leaves all other options the way that they were. If you had a word underlined in a paragraph, for example, and later changed the whole paragraph to boldface, the word will remain underlined in the text. However, if you choose the Plain Text style, it cancels all other style choices within the block.

You can change the font or style in the middle of a line, but the results may sometimes appear strange. If, for example, you change one word from 12- to 24-point type, the other words in the line will have a large space separating them from the line above because lines are always spaced to accommodate the tallest font in the line.

**F***Formatting Options* The console line underneath the menu bar contains a series of icons that let you set formatting options for your text. These options include line spacing, text justification, tabs, and margins. The commands on the Format menu also affect page formatting.

The ruler line in the text is your key to what options you have set. Later in this section, you'll find out how to insert multiple ruler lines so that you can set options for individual parts of your text. Until then, think of these options as affecting your entire text.

**Line Spacing** The first three icons along the left end of the console line affect the spacing between lines. The default is single spacing, indicated by the icon containing the number 1. If you want a different spacing, you can click one of the other icons—1.5 for one-and-one-half spacing and 2 for double spacing.

When you click one of these icons, the text is immediately reformatted on the screen. This is a general feature of all Jazz formatting options—if it affects the page, it affects the screen. If you don't like what you see, you can quickly choose another option.

**Text Justification** The next set of four icons deal with text justification, or how each line is arranged to line up between the

margins. These icons, which contain a series of horizontal lines of different length, illustrate how the text will look with each of these options.

The default icon calls for left justification. With this option, each line begins on the left margin and contains however many words will fit before the right margin. Each line will be of a different length, so the right margin will be ragged. This option resembles the text that you would produce on a typewriter.

The second icon is for right justification. Like left justification, this option creates lines of different lengths. Here, however, the word processor arranges the text so that it lines up evenly on the right margin and remains ragged on the left. If you type a new line with right justification, the insertion point will start and remain on the right margin, and the text will slide out to the left. When the line becomes full, the insertion point and the last word will wrap down to the next line.

The third icon centers text between the left and right margins. Centered text is usually used for one-line headings and titles, but it can also be used for word-wrapped paragraphs. If you type a line of centered text, the insertion point will start in the center of the screen. As you type, the insertion point moves gradually over toward the right margin, and the text slides gradually toward the left. When the text gets too long for the line, the last word will wrap down to the center of the next line.

The fourth icon shows a series of lines that are all the same length, representing full justification. With this option, the word processor adds spaces between words so that every line fills the entire space between the left and right margins. The extra spaces are distributed evenly between all the words in the line, so that they are barely noticeable. The resulting paragraphs are aligned along both the left and right margins, like the paragraphs in this book.

Full justification doesn't pad out any line that isn't long enough to have a wrapped word. It just leaves the short line, typically ended by a hard carriage return, left-justified. The last line in a paragraph will usually be printed this way, since it doesn't need to reach the right margin. A series of short lines such as the address on a letterhead will be aligned along the left margin in both the left- and full-justification formats.

**Tabs** On a typewriter, you can set tab stops at specific columns. Then, using the Tab key, you can go directly to these columns. This is useful for such tasks as creating a columnar table.

Jazz's word processor has a similar tab feature, represented by the next two icons on the console line, which are the small triangles pointing upward. To indicate a tab stop, you place one of these triangles, or tab markers, on the ruler line.

When you create a new word processor document, three initial tabs are set at the 1½-, 4¼-, and 5-inch marks. You move, add, and delete stops by clicking on this ruler line.

If you haven't selected either of the tab icons on the console line, you can move the tab stops. Try dragging one of the preset tabs. You can move it anywhere along the ruler line until you run up against the next tab stop. Jazz prevents you from moving the tab marker closer than 3/8 inch from the next tab stop.

To add or delete a tab marker, click the left icon of the two on the console line—the triangle that has nothing inside it. The other icon represents a special decimal tab, described later in this chapter.

Once you have chosen this icon, you can no longer drag the tab markers along the ruler line. Instead, you click on the ruler line to add or delete tab markers. If you click on a place where there is already a marker, you delete that marker. Otherwise, you add a tab marker at that point.

Don't get confused by this double system. If neither triangle icon is highlighted, the mouse moves the tab markers. If an icon is highlighted, the mouse adds or deletes a tab stop on the line. To go back to moving the tab markers, turn off the icon's highlighting by clicking the icon again.

To skip to a tab, press the Tab key. The insertion point will move directly to the next tab stop on the line, or it will move to the first one on the next line if there are no more stops on the current line.

The Tab key inserts an invisible tab character into the line. You can remove this character by pressing the Backspace key. When you delete the tab, the insertion point jumps back to the end of the previous text.

If you go back and insert text to the left of the tab character, it will not move anything on the right of the tab. Tab characters represent a variable space within the line—whatever is required to move over to the next tab stop.

Try an experiment to see how this works. Type a few letters at the beginning of a line. Press Tab, then type some more. The second group of letters will begin from the tab stop beyond the end of the first group.

Now move the insertion point back to the end of the first group of letters and type some more. The new letters will be added to the

end of the first group without moving the second. The tab space simply contracts to accept the new characters.

Only when you type enough new letters to run up against the second group does the second group move. When this happens, this group suddenly jumps over to the next tab stop to the right. The tab character is still there; however, it has been moved far enough over that it no longer points to the stop where it pointed before. Its mission, "jump to the next tab stop," now means to jump one stop more to the right.

The advantage of using tabs is that you can change the alignment of columns merely by moving the tab stops on the ruler line. The columns in your text move automatically when you change the tab stops on the ruler line. If you move or add a tab stop, the tab characters will point to a new set of columns. When you move a tab stop, for instance, all the text aligned under it will be shifted over. Figure 6.14 shows two views of a document: one view before moving the tabs and one view after adjusting them.

The tab characters always point to the current tab stops in order from left to right. If you add a stop near the beginning of the line,

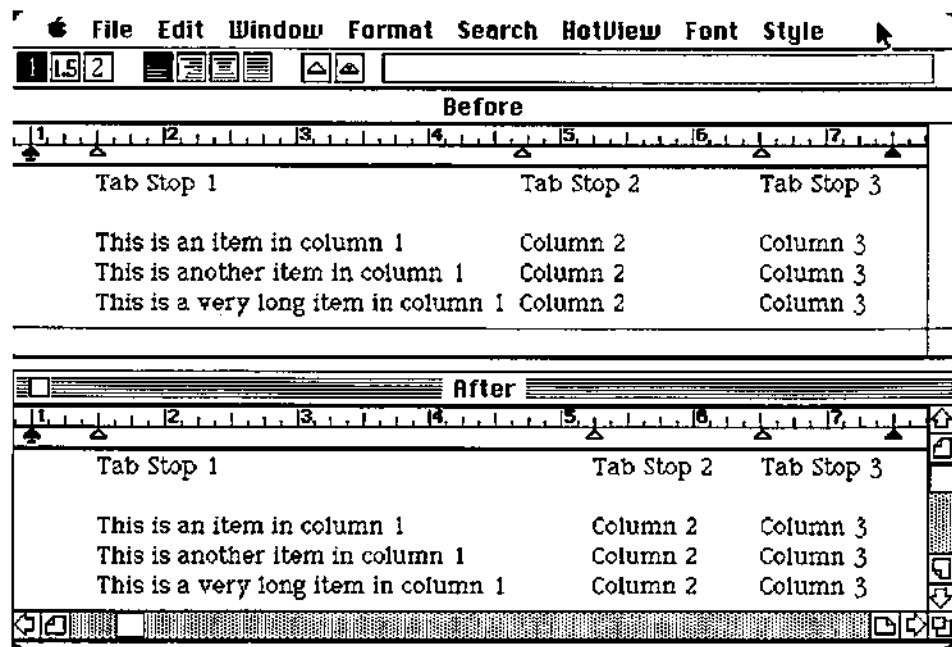


Figure 6.14: Changing the tab stops automatically realigns the columns underneath them.



the columns after that will shift over to point to the previous tab stop. If you delete a tab near the beginning of the line, the tab characters will move their text one tab stop further to the right.

The columnar realignment breaks down, however, when one of the entries is so long that it passes the next tab stop. An entry that is too long will push the remaining tab characters over one tab stop. Figure 6.15 shows how this can make a mess of a table when you move tab stops carelessly. In this case, the long entry has even wrapped the last column down to the next line. To restore the table, just move the tab stops again so that the column has enough room for the longest entry.

The Jazz word processor offers two different kinds of tabs: normal tabs and decimal tabs. With a normal tab (what you're used to from a typewriter), the tab key moves the insertion point directly to the tab stop and left-justifies the new column.

A decimal tab is a fancy addition that is useful when you're typing columns of numbers. A decimal tab aligns its text along the first decimal point or space that it encounters. This is handy if you have a

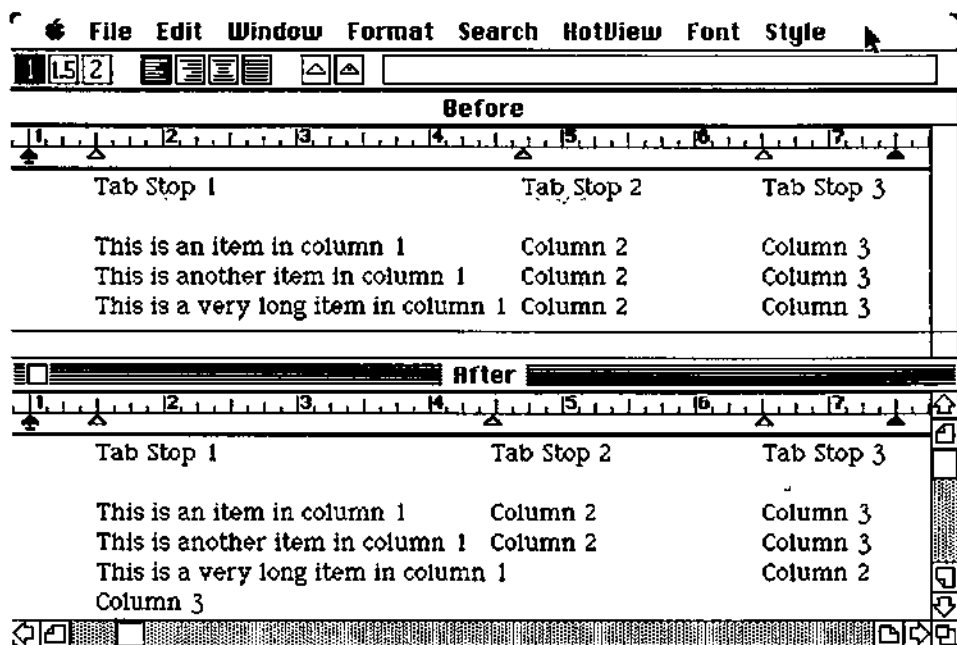


Figure 6.15: A column that is too narrow for an entry can foul up the arrangement of a table.

series of numbers, as in Figure 6.16. A decimal tab is indicated by a triangular tab marker with a period inside it.

When you first tab to a decimal tab stop, the insertion point appears right under the tab marker. As you begin typing letters or numbers, they move out to the left of the insertion point—these are the characters to the left of the decimal point. Then, when you type a period or a space, the word processor places it directly under the tab marker. After that, any characters that you type move to the right of the decimal point or space to form the decimal part of the entry. Note that you can include letters, commas, and special characters to the left and right of the decimal point or space.

**Margins** The solid triangles on the ruler line represent the left and right margins on the page. The margins are preset at 1 and 7 1/2 inches when you open a document.

You can change the margins in much the same way as you change tab stops. You can move the margins to any point on the ruler line,

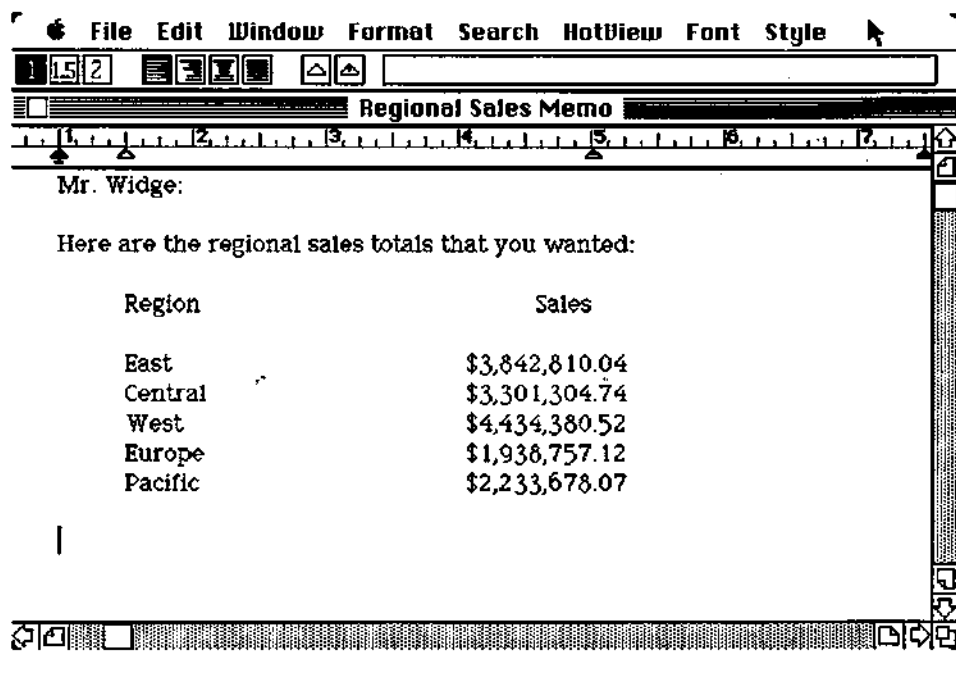


Figure 6.16: Normal and Decimal Tabs.

except inside of a tab stop, by dragging the markers to a new location. The text will immediately be reformatted to fit your new margins.

You cannot add or remove the margin markers, so there is no need for a margin icon on the console line. The margin markers are always waiting for a drag, rather than a click. If, however, you have chosen one of the tab icons on the console line, you must turn it off before you move the margin markers. You cannot drag a margin marker when the program is waiting for you to click a tab marker.

The marker on the left margin is actually two markers. One is a solid triangle like the marker on the right margin. The other is a thin arrow with a solid bar at the bottom. When you first open the window, the two markers are superimposed, but you can move them apart by dragging one of them.

The thin arrow is an indentation marker, which shows where the first line in a paragraph will begin. All other lines in the paragraph line up with the solid triangle, which is the actual left margin. In the default ruler line, both markers are set at the 1-inch mark, so all the lines in the paragraph will line up flush left at that point.

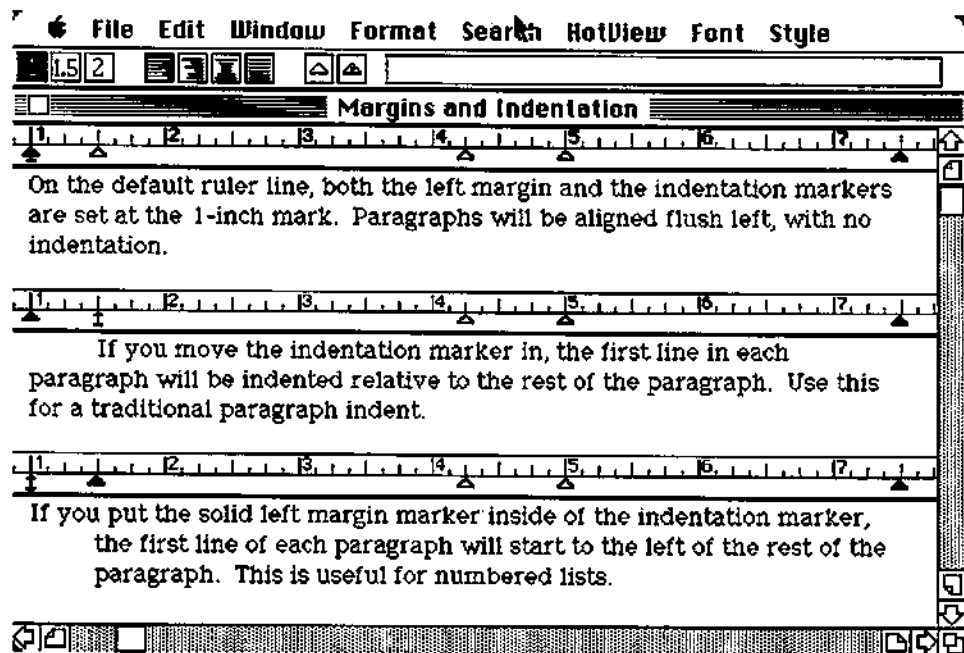


Figure 6.17: You can set an indentation marker for the first line of each paragraph.

As shown in Figure 6.17, you can place the indentation marker either to the right or left of the left margin. If you put the indentation marker to the right, the first line of every paragraph will be indented, like the paragraphs in this book.

This automatic paragraph indent is useful, but it means you're locked into the indentation for every line that begins a new paragraph. In documents where you want to mix indents with blocks that have all lines flush left, you may find it easier to leave the two markers in the same spot and indent each paragraph manually with a tab.

If you put the indentation marker to the left of the left margin, the first line of each paragraph will begin to the left of the permanent margin. This is useful for numbered lists like the one in Figure 6.18.

You can move the margin and indentation markers outside the boundary of the document window. Click the scroll bar at the bottom of the screen to scroll the text horizontally, then drag the marker.

If you make the margins wider than the screen, you will not be able to see a whole line at once. When you type, however, the

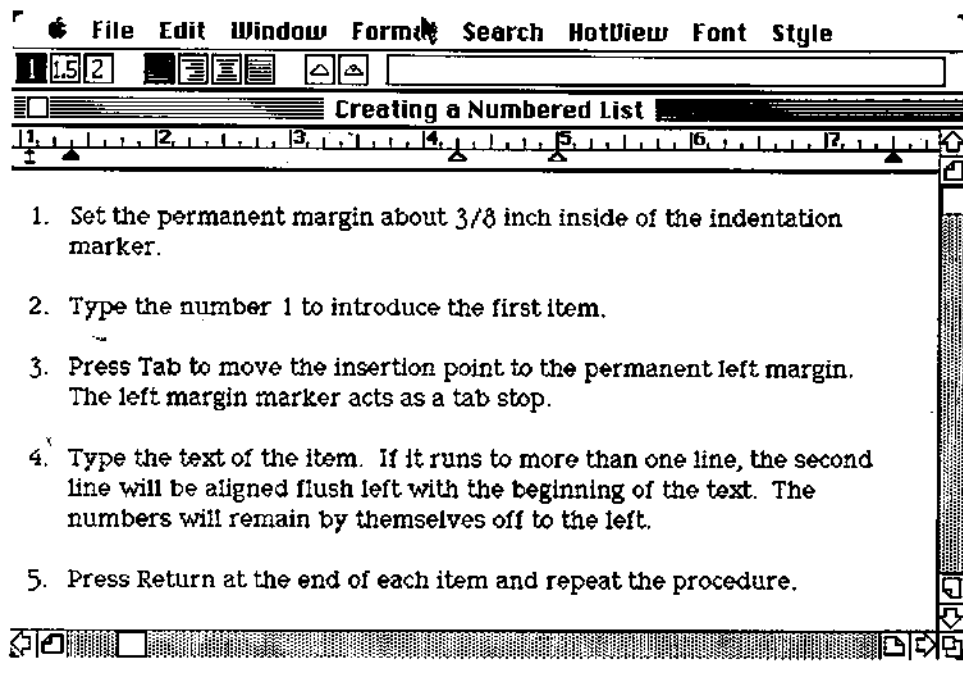


Figure 6.18: The steps for creating a numbered list.

word processor will automatically shift the text to the left and right so that you can always see the insertion point.

**Multiple Ruler Lines** You may not want some of your formatting options to apply to an entire document. You might have a paragraph that you want to indent separately, or you might set up a table that you want to design with special tab stops.

The Insert Ruler command on the Format menu lets you set up ruler lines that control just part of your document. Each ruler affects the text that comes below it, down to the next ruler or to the end of the document.

When you choose Insert Ruler, the word processor inserts a copy of the current ruler into your text. If this is the first time you've inserted a ruler, you will get the same one that is at the top of your document. If you have already inserted other rulers, the command will insert a copy of the last ruler above the insertion point in the text.

On this new ruler, you can set tabs, change margins, or choose other formatting options that will affect only the text that follows the ruler. If you move the insertion point back above the ruler, the formatting options will change back to those that you set for that previous section of the text.

The ruler line includes the settings for line spacing and justification, as well as for tabs and margins. The line spacing and justification are not shown on the ruler line, but the options you select apply to the whole section between two rulers. If you move the insertion point into another section where these options are set differently, the icons on the console line will change automatically.

If you're creating a table, you might want to set up a special ruler line for it, then revert back to the previous ruler. The easiest way to do this is to choose Insert Ruler twice—once at the top of the table and once at the bottom. Then change the tab and margin settings in the ruler at the top, leaving the ruler at the bottom the same as the one that controls the text above the table.

You can also insert ruler lines by cutting and pasting. Click on the upper half of a ruler, and it will be highlighted. Then use the standard Cut, Copy, and Paste commands to move the ruler to the Clipboard and paste it back in at another point. In this way, you can insert a ruler from anywhere in the document, not just the ruler immediately above.

You can cut or clear any ruler line except the first one. When you remove a ruler, the text beneath is then controlled by the previous

ruler. You cannot delete the first ruler line because the word processor needs some way to determine the format of the text in the file.

**Hiding Ruler Lines** If you are doing fancy text formatting, you will find yourself inserting many different ruler lines in your text. The ruler lines can become so distracting that you may not be able to visualize how the page will look.

The solution is to choose **Hide Rulers** from the **Format** menu. **Hide Rulers** eliminates all the ruler lines from the document window, including the first. Your window will then match exactly the way your document will look on the printed page.

Although hidden, the ruler lines still control the formatting of the text. Line spacing, text justification, tabs, and margins are all as they were set on the ruler lines before you hid them. If you have multiple rulers, each hidden ruler will continue to control the section below it in the text.

With the ruler lines hidden, you cannot change tabs and margins. To make those kinds of changes, you must first choose **Show Rulers** from the **Format** menu, and then edit the visible ruler line. However, you can change the line spacing and justification when the ruler lines are hidden by clicking the appropriate icon on the console line.

**Page Breaks** The Jazz word processor automatically divides a long document into pages. By default, the word processor uses a page length of 11 inches, the length of a page on the Imagewriter. This corresponds to 47 lines of text in the default 12-point New York font. The number of lines will be different in other fonts and sizes.

You can change the length of a standard page by choosing one of the other options on the **Page Setup** box under the **File** menu. If you choose **Corporate Label** or **Small Label**, for instance, the word processor will insert page breaks after each address to generate each label on its own page.

When you type enough lines to fill up a page, the word processor draws a dotted line across the window to show where it is dividing the text. This automatic page break is not fixed; if you add text or change the font size of lines on the previous page, the page breaks will be rearranged so that each page contains 11 inches of text.

You can also add your own page breaks by choosing **Insert Page Break** from the **Format** menu. When you use this command, the

word processor draws a solid horizontal line across the window. On the printed text, the previous page will be finished with lines of blanks. The text below the horizontal line will always start on a fresh page. You might want to use this command before the beginning of a new chapter in your document or before a table that you want to keep as a unit.

This manual page break acts a little differently from the automatic breaks. First of all, you can delete it either by clearing it as a block or by backspacing across it. You can copy or change the inserted page breaks as if they were special characters inserted in your text. Automatic page breaks, on the other hand, cannot be moved or deleted.

Another difference is that the manual page breaks always start a new page, even if you add text above them. An inserted page break will begin a new page even if the previous page has only one line on it. If you add lines to a previous page, the new text will be split differently across the automatic breaks, but will still be broken at the inserted page break. If you add enough text so that it won't all fit on the page before the inserted page break, another page will be created, then padded out with blank lines so that the manual page break still starts a new page.

**Headers and Footers** The word processor lets you create headers and footers that will be printed at the top and bottom of each sheet in your document. You can use these lines to produce running heads of the document's title and to mark pages with page numbers or other identifying information.

To create a header or footer, choose Header or Footer from the Format menu. An empty document will open, with a title such as **Document Name:Header.**

You can type text into the Header and Footer boxes just like any other document, except that the page is limited to about 11 lines. If you type more lines than that, you will see a dotted line, which looks like an automatic page break. Any text below that line will not appear in the header or footer.

You can choose formatting information for the headers and footers that is different from the rest of the text. You might, for instance, want to center the header at the top of each page. If you select the centering option in the Header window, it will affect only the headers, not the regular text.

You may want to include the current page number as part of your header or footer. To do this, use the Page command from the Hotview menu. This feature is described later in this chapter.

When you're done typing the header or footer, click the close box in the window's outline. When you get back to the main document, the new headers and footers will automatically be included at the top and bottom of each page. The first page will not include the header, but it will have the footer.

Headers and footers are displayed as if they are part of the text, but you cannot edit them within the text. If you try to click on the header text, the insertion point will appear after the last character on the previous page. To edit the header and footer, you must open the Header or Footer window from the Format menu.

In most cases, you'll want to leave one or two blank lines at the end of a header and at the beginning of the footer to separate their text from the rest of the document. If you want extra space at the top or bottom of each page, you should include these spaces as part of your header or footer. Every line in the header and footer takes away a line from the text on the page.

In Jazz, one header applies to all the pages of a document. There is no way to turn headers and footers on and off for different pages or to change them for certain pages.

**Cut and Paste between Documents** In previous chapters, you have seen how each of Jazz's modules works with the others. In a worksheet, you can include information out of a database. In a Graphics window, you can create a chart based on information from either a worksheet or a database.

The word processor lies at the summit of Jazz's integrated design. In a word processor document, you can insert information from any of Jazz's other modules—a table from a database, a list of figures from a worksheet, a graph from the graphics module, or a part of a communications session from the communications menu. Using the Macintosh's Clipboard and Scrapbook, you can even include text and graphics from programs other than Jazz. The Widgco presentation in Chapter 9 is a word processor document consisting largely of information inserted from other Jazz modules.



The Jazz word processor lets you insert information in two different ways:

- **Static Cut and Paste:** Using the Clipboard, you can cut text or graphics out of any Jazz document and paste it into a word processor document. This transfer is called static because the pasted text does not change if its source is changed.
- **HotViews:** The Jazz word processor also has a special Hot-View feature that lets you paste database, worksheet, and graphics information that will be automatically updated to match the latest version.

These two types of transfers work in fairly different ways. We'll start with the simpler technique, static cut and paste.

***Static Cut and Paste within the Word Processor*** Earlier in this chapter, you learned that you can move blocks of text within a word processor document by using the Cut and Paste commands. Cut and Paste can also be used to move text from one Word Processor window to another.

The Clipboard is the holding area for Cut and Paste. The Cut and Copy commands move a block of text from the active window to the Clipboard. Paste inserts the contents of the Clipboard back into your text at the insertion point. Throughout Jazz, you can examine the Clipboard's contents by choosing Clipboard on the Window menu.

If you mark a block in one word processor document and then choose Cut or Copy, the block will be moved to the Clipboard. The block will remain there until you choose Cut or Copy again. The text even remains on the Clipboard if you switch to another Word Processor window. If you mark a new insertion point and choose Paste, the text will appear as part of the second word processor document.

Ruler lines and other formatting information are transferred if you mark them as part of the block. If you don't include a ruler line in the block (text is often formatted by a ruler that lies above the beginning of the block), the text will be formatted by a ruler line in the new document. So, you may need to adjust or insert a ruler in the new document to make the text look the same.

**Cut and Paste from a Database or Worksheet** You can paste information from a Jazz database or worksheet into a word processor document. The information can be anything from a single cell to an entire database—you can transfer as much information as will fit on the Clipboard.

Start by opening the database or worksheet document that has the information that you want to transfer into your text. Keep the Word Processor document open so that you can quickly return to it.

Next, mark the section of text that you want to cut or copy from the database or worksheet. In a database, you can mark the following:

- A single cell
- An area of adjacent cells
- An entire field (but not a series of fields)
- A record or series of records
- All the records that satisfy a query (using the Select with Criteria command)
- The entire database (using the Select All command)

In a worksheet, you can mark these items:

- A single cell
- A range of cells
- An entire column or series of columns
- An entire row or series of rows
- The entire worksheet (using the Select All command. However, you can only transfer the active region)

Mark the items that you want to move, then choose Cut or Copy on the Edit menu.

**Pasting a Worksheet into a Memo** Say, for example, that Mr. Widge wants the totals for each region's sales and sales commissions. You have the figures in a small worksheet, like the one shown in Figure 6.19. Now you want to paste them into a memo that you're writing.

File Edit Window Range Tools Font Style

C10

|    | A       | B               | C              | D | E |
|----|---------|-----------------|----------------|---|---|
| 1  | Region  | Sales           | Commissions    |   |   |
| 2  |         |                 |                |   |   |
| 3  | East    | \$3,842,810.04  | \$561,382.14   |   |   |
| 4  | Central | \$3,301,304.74  | \$502,749.74   |   |   |
| 5  | West    | \$4,434,380.52  | \$679,387.35   |   |   |
| 6  | Europe  | \$1,938,757.12  | \$292,128.73   |   |   |
| 7  | Pacific | \$2,233,678.07  | \$318,319.92   |   |   |
| 8  |         |                 |                |   |   |
| 9  | Total:  | \$15,750,930.49 | \$2,353,967.88 |   |   |
| 10 |         |                 |                |   |   |
| 11 |         |                 |                |   |   |
| 12 |         |                 |                |   |   |
| 13 |         |                 |                |   |   |

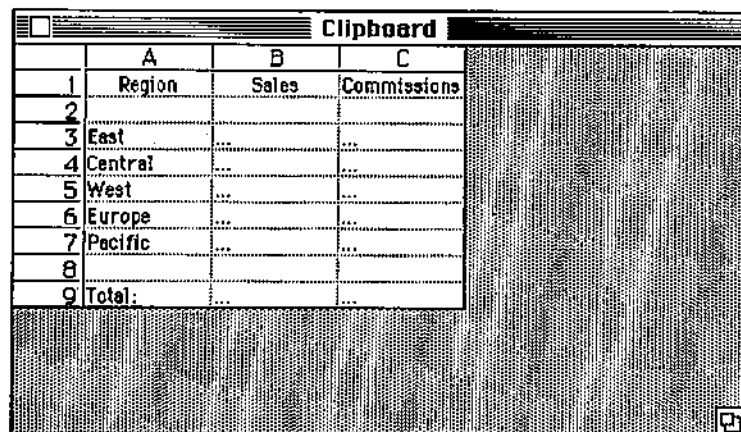
Figure 6.19: The worksheet from which you'll be copying your figures.

Mark the part of the worksheet that you want to copy. In this case, you'll probably want to mark the entire active region of the database, the range A1 . . C9. If you just want the data, you would start the range in row 3 of the worksheet.

You could also mark all three columns, A . . C, or choose Select All to mark the entire worksheet. If you mark an entire column, row, or worksheet, Jazz will cut or copy only the active region of the worksheet. Otherwise, you might find you have a Clipboard with a column of 8191 numbers.

Use Cut or Copy to move the range to the Clipboard. To see what you're doing, call up the Clipboard using the command on the Window menu. The range from the worksheet will be shown there, as in Figure 6.20. You'll see that the Clipboard copy shows three dots rather than the actual worksheet figures in the columns and that the columns are all the same width. This is because the worksheet's formatting information about column width is not copied to the Clipboard.

File Edit Window



The image shows a 'Clipboard' window from a Macintosh. Inside the window is a table with three columns: 'Region', 'Sales', and 'Commissions'. The rows are numbered 1 through 9. The data is as follows:

|   | A       | B     | C           |
|---|---------|-------|-------------|
| 1 | Region  | Sales | Commissions |
| 2 |         |       |             |
| 3 | East    | ...   | ...         |
| 4 | Central | ...   | ...         |
| 5 | West    | ...   | ...         |
| 6 | Europe  | ...   | ...         |
| 7 | Pacific | ...   | ...         |
| 8 |         |       |             |
| 9 | Total:  | ...   | ...         |

**Regional Sales**

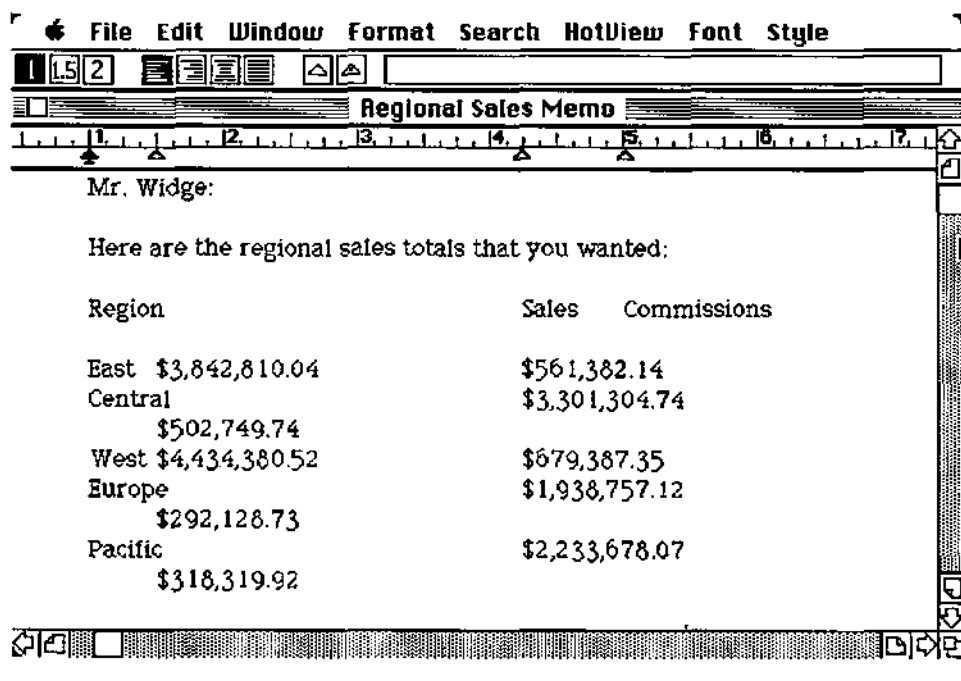
**Figure 6.20:** The contents of the Clipboard after you copy the range from the worksheet.

Now switch back to the Word Processor window that contains the memo that you're writing. Place the insertion point at the place where you want to paste the text.

For a Cut-and-Paste operation, you need to keep track of the way the worksheet and database information is represented. Jazz treats each row in the table as a line of text ending with a carriage return. Within the line, the columns are set off by tab characters. You can change these column separators by choosing the Parse Settings command on the worksheet or database Edit menu.

The word processor's Paste operation formats the table according to the tabs on the ruler line. Each row on the worksheet will start on a new line of text, and each column will be lined up under the tab stops.

In general, you'll want to create a special ruler line for the table before you paste in the worksheet data. If you simply pasted the figures with the default ruler line, you would get an incomprehensible jumble, as in Figure 6.21. This is because the tab stops were not of the proper length to hold the text in each column (the same problem that caused the columns in Figure 6.15 to be split up when tab stops were moved without care).

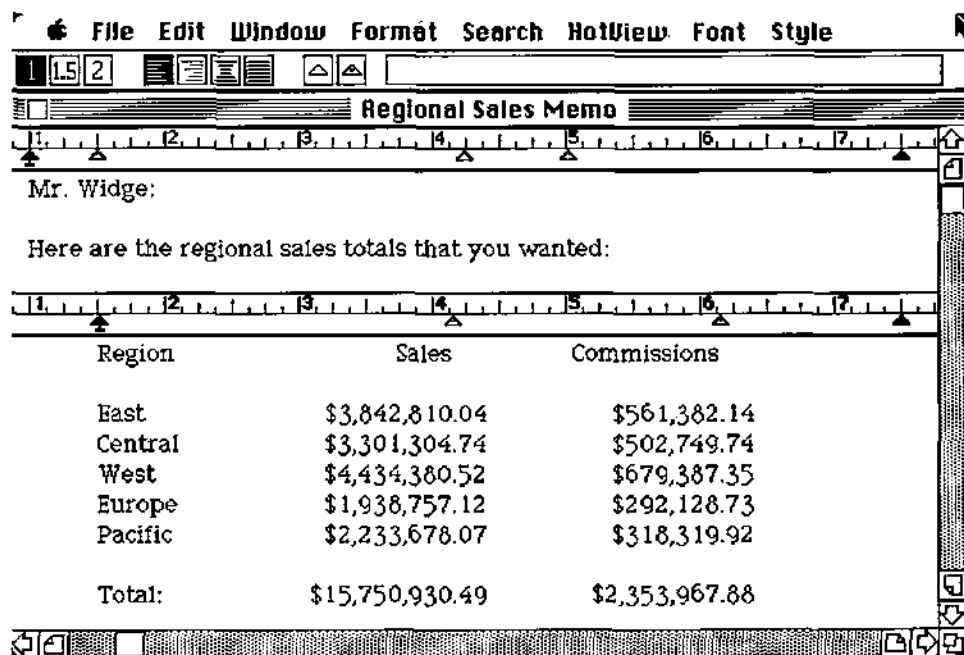


**Figure 6.21:** This is how the pasted figures would look with the default tab settings.

To create a new ruler line for the table, choose Insert Ruler from the Format menu, then set the tabs roughly for the columns that you want. The first column on the Clipboard will be lined up with the left margin. If you want the table indented, move the left margin in a bit. If, as in this case, you expect some of the columns to contain numbers, you should set those tabs as decimal tabs. Be sure that you set the same number of tabs as you have columns in the table that you are pasting and that you leave enough space for each column.

Now choose Paste from the Edit menu. If you have set your tabs correctly, you will get a neat table, like the one in Figure 6.22. If you need to rearrange the columns slightly, you can move the tab stops a bit to the right or left.

**Editing a Transferred Table** In Figure 6.22, the headings of the two columns to the right are aligned to the left of the decimal tabs. If you wanted to center the column headings, you could create another ruler line just for them.



**Figure 6.22:** With tab stops set properly, the worksheet table will be pasted in neat columns in your document.

If you don't arrange the tabs properly before you paste, you can still try adding a ruler line afterwards and then rearrange the columns. However, the lines that wrap down to the lines below are often not rearranged correctly (as in Figure 6.21). You may find that you'll need to go through the table manually and remove the carriage returns that were added as you pasted the table.

With a large table, you may have trouble fitting all of the columns onto one line. If this is the case, you might try changing to a smaller type size before you paste the table. For example, a table in 9-point type will obviously be able to fit more columns on a page than one in 12-point type. The pasted text will appear in whatever font and size you have selected at the insertion point. Another alternative is to widen the margins enough to accommodate the text. These modifications don't have to be permanent. You can always change the table back to a more normal font size or margin once you've seen how it will fit.

Once you've pasted the table into the document, it becomes text rather than worksheet data. You can perform any of the standard

word processing operations on this text: add text in the middle of the chart, change fonts or type styles, and even cut and paste parts of it into other parts of your text. You might, for example, want to mark the headings as boldface or make them a larger type size. Or, you might want to use Find and Replace to remove the dollar signs before the numbers in all rows but the first one in the table.

Cut and Paste work the same for database documents. Columns in the database are marked with the same internal characters as worksheets—tab characters between columns and carriage returns at the ends of lines. Database information is pasted into Word Processor documents in exactly the same way as worksheet information.

It is possible to cut and paste information out of a data-entry form, but only from a single box at a time. You cannot mark a whole form and paste it into a document.

***Pasting Graphics into a Document*** You can paste graphics into word processor documents. By mixing text and graphics, you can create some very impressive business graphics presentations.

You must first have a graph to paste. Open a Graphics window and create a graph using the commands described in Chapter 5. As an example, we'll use an overlapping bar graph created from a worksheet of regional sales data that we've been using.

***Pasting a Bar Graph into a Word Processor Document*** We're going to copy the entire bar graph into our word processing text. Actually, we don't have many choices—Jazz will only let us copy a whole graphics document. We can't use Cut, and we can't transfer just portions of a graph.

Choose Select All from the Graphics window's Edit menu. The graph is highlighted by a thick box around its edge, as shown in Figure 6.23. Then choose Copy from the Edit menu. The graph will be transferred to the Clipboard.

Now go back to the word processor document. Place the insertion point at the end of the line that you want the graph to follow or at the beginning of a fresh line. Then choose Paste. The graph will appear directly in your text, as shown in Figure 6.24.

The graph must be set off by a carriage return from the rest of the text. If Jazz doesn't find a carriage return at the insertion point, it will insert one to get a fresh line. So, if you place the insertion

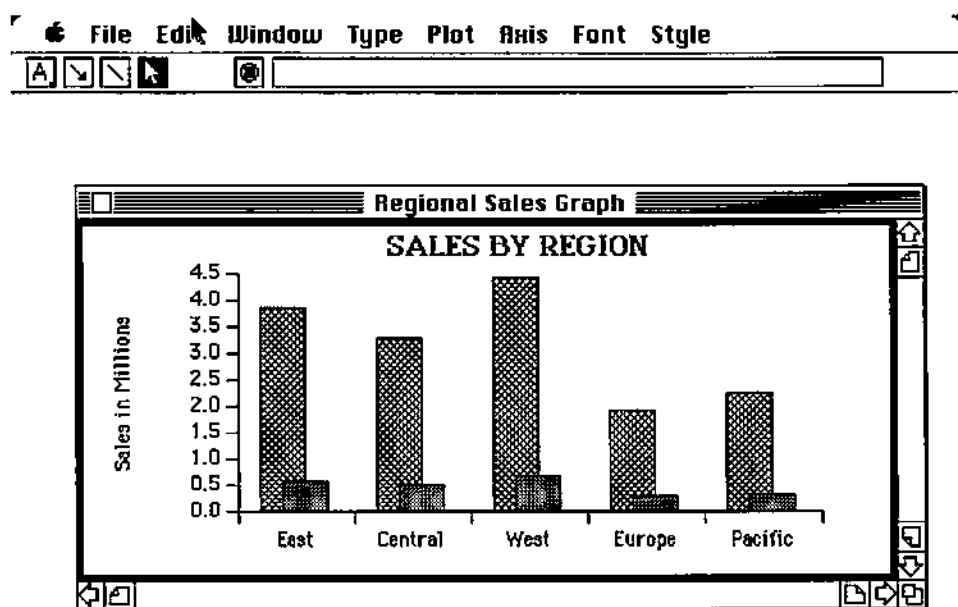


Figure 6.23: With graphics, you can only transfer the entire window using *Select All*.

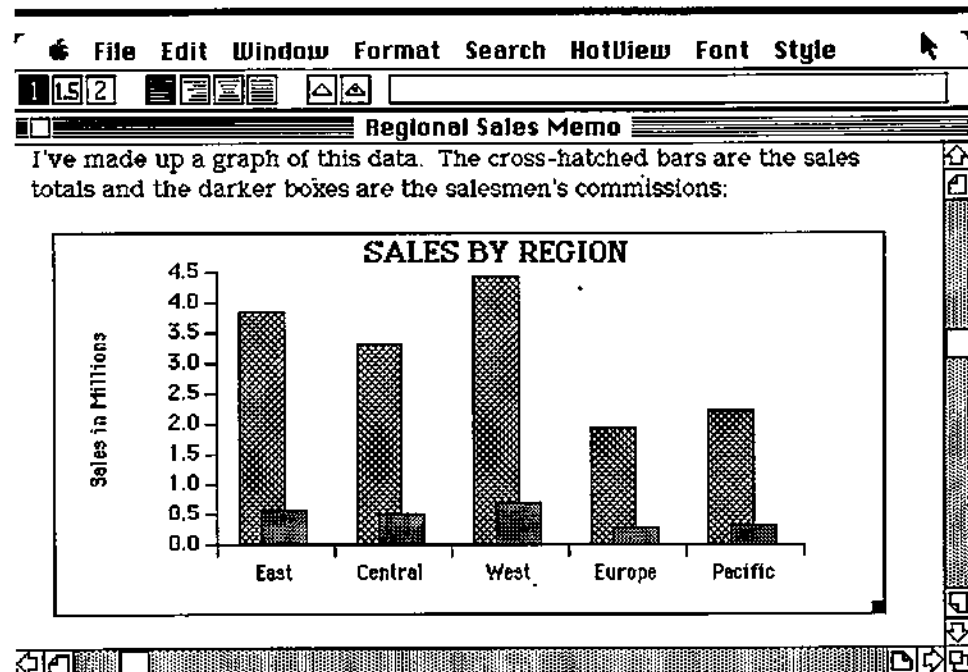


Figure 6.24: A graph as it is pasted into a word processor document.



point in the middle of a line, Jazz will add a carriage return at that point, breaking up the text that you typed.

You cannot change a graph while it's in a Word Processor window. If there are any changes you want to make—different labels, different text fonts, different graph types—make them before you copy the graph to the Clipboard. Of course, if you later decide you want to change something, you can always go back to the Graphics window, make the change, and copy the graph again.

**Moving and Resizing Transferred Graphics** The only things you can do to a transferred graph is move it and change its size. Even these capabilities are restricted: you cannot move the graph outside the margins or paste it inside a paragraph of text.

When it's first pasted, the graph appears with a box around it. This box resembles the resizing boxes in the graphics modules. It has a border that you can drag to move the graph and a dot in the corner that lets you resize the box. The border is not printed as part of the document.

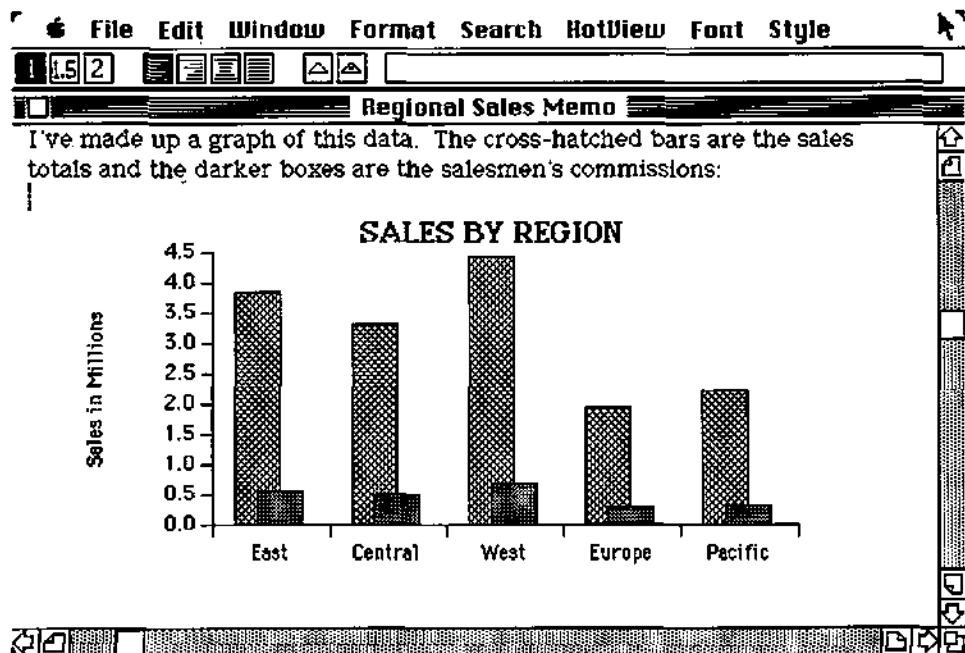
When you click anywhere outside the graph, the border disappears, as in Figure 6.25. Now the graph is fixed as part of the text. You cannot move or rescale the graph again without clicking on it first to restore the border.

You can move the graph as a unit by dragging on its border. To drag the box, you must press the mouse cursor, which has taken on a cross-hair shape, right on the edge of the graphics box. Nothing happens if you drag on a point inside the box. However, if you have transferred a default-sized graph into a word processor document with default margins, there isn't much room.

You can drag the graphics box a bit in the horizontal direction, but the left and right edges of the graphics box must fall inside the margins. You cannot drag the box in the vertical direction. (Although the box seems to move a bit vertically while you drag, it just reappears at the same height when you release the button.)

You can also move a graph to another place in the same word processor document or to another document using the Cut and Paste commands. If you decide that the graph really belongs somewhere else in the text, mark it as a block, cut it, and paste it in the new place. You can cut the graph either alone or as a part of a larger block of text.

Before you mark a graph as a block, you must first click somewhere else in the text to remove the graph's border. Then you double-click the graph to mark it as a block, as shown in Figure 6.26. (A single click merely brings back the graph's border.)



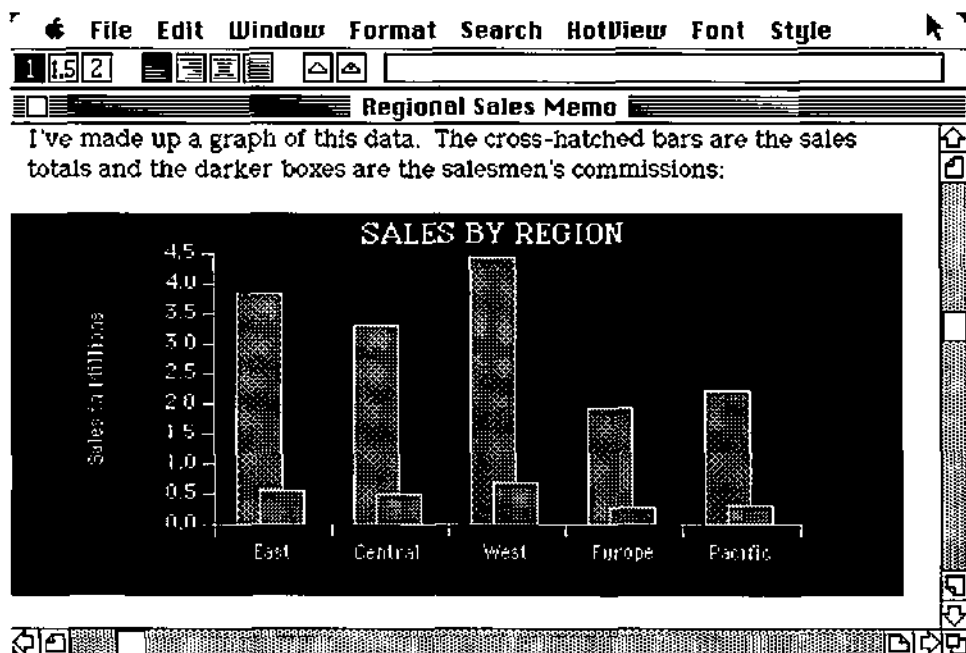
**Figure 6.25:** Click outside the graphics box to remove the editing border.

The small square in the lower right corner of the graph lets you shrink or stretch the entire graph. Just drag the square to the place where you want to put the new lower right corner. The upper left corner remains fixed. Moving the square to the left or right resizes the graph horizontally, and moving it up or down resizes the graph vertically. You can change both the horizontal and the vertical dimensions of the box at once.

In general, the text in stretched graphics is slightly distorted and harder to read than the text in a regular font.

Of course, if you don't like the smaller or larger version, you can always rescale the box back to its original size. Jazz retains all its graphics information. Even if you reduce the size of the graph to miniscule, it will return to its original resolution when you expand the box again.

Whether you move or resize the graph, it always remains an indivisible block that extends the whole width of the page. You cannot type a column of text along the side of the graph or add text on top of it.



**Figure 6.26:** You can mark a graph as a block, then cut or copy it to another place in the text.

**Cut and Paste from Other Programs** In addition to cutting and pasting directly from the other modules of Jazz, you can cut and paste text and graphics from other Macintosh programs.

The Cut, Copy, and Paste commands are almost universal to Macintosh software, and they always work through the Clipboard. If you are running another program on your Macintosh, whatever you cut or copy to the Clipboard will still be there when you switch to Jazz (as long as you don't turn off the computer). You can then use Jazz's Paste command to insert the text into your Jazz document.

If you want to move more than one piece of text at a time, you can paste the pieces into the Scrapbook and then cut them back out when you get into Jazz. You can also use the Scrapbook for set pieces of boilerplate text that you want to insert into many different parts of your text—an example might be the memo head shown in the sample memo at the beginning of this chapter. Read your Macintosh manual for more information on using the Scrapbook.

If you're transferring text, Jazz treats it as if it had come from its own word processor or worksheet. If the text that you cut from

the other program contains tab characters, they will move text to the next insertion point, just as tab characters do in the Jazz word processor. Note, however, that you cannot usually cut and paste ranges of cells from other worksheets into Jazz. Programs like Multiplan use a different system for coding their data.

If you're transferring graphics, Jazz lets you paste the picture into your text, just as if it were a Jazz graph. You might, for example, want to include part of a MacPaint picture into your memo. Just go into MacPaint, cut the part of the picture to the Clipboard, then go into Jazz and paste it into your document. Jazz places a border around the picture so that you can move it or change its dimensions.

**H**otViews Jazz lets you do another type of cut and paste called a HotView. Instead of actually inserting the pasted text into the word processor document, Jazz inserts a reference to the other Jazz window, which automatically shows the current version. That way, if you go back and change the information in the other window, the word processor's version will be updated accordingly.

**The Include Command** You insert a HotView into your text with the Include command, the first item on the HotView menu. Only this one command is required—you do not use the Clipboard with a HotView.

**HotViews from the Database, Worksheet, and Graphics Modules** Start by marking the section in the other module's window that you want to include as a HotView. In a database, you can mark any of the following:

- A single cell
- An area of adjacent cells
- An entire field or series of adjacent fields
- An entire record or series of adjacent records
- The entire database (using the Select All command)

Note the differences between this list and the list of items you can mark for cut and paste. HotViews don't allow you to include a

series of nonadjacent records that satisfy a database query, but they do allow you to copy several entire fields.

In a worksheet, you can mark the following items to include as a HotView:

- A single cell
- A range of cells
- An entire column or series of columns
- An entire row or series of rows
- The entire worksheet (using the Select All command. Cut includes only the active region)

For a graphics HotView, go to the graphics window and click anywhere inside it. This is all you need to do to establish a reference to the Graphics window. As with Cut and Paste, you can only include a Graphics window as a whole unit. You cannot select an isolated part of a graph for a HotView.

Now switch back to the word processor document and place the insertion point where you want to put the HotView. Then choose Include. The piece you marked in the Database, Worksheet, or Graphics window will automatically appear at that point in your text.

To see the reference that the Include command is using, choose Reference Board from the Window menu. The Reference Board window will appear, showing a code such as

**Worksheet Regional Sales: A1 . . C9**

or

**Graphics Regional Sales Graph**

This is the HotView that the Include command will insert.

Once you've used the Include command, the section of the other document appears in your text. Figure 6.27 shows part of a worksheet inserted as a HotView. The word processor types a code in the reference box on the console line to show where the HotView came from. In Figure 6.27, the reference is to a range in a worksheet:

**Regional Sales: A1 . . C9**

You can think of a HotView as a window into the other Jazz document. You are literally looking at part of a Worksheet, Database, or Graphics window as a part of your word processor document.

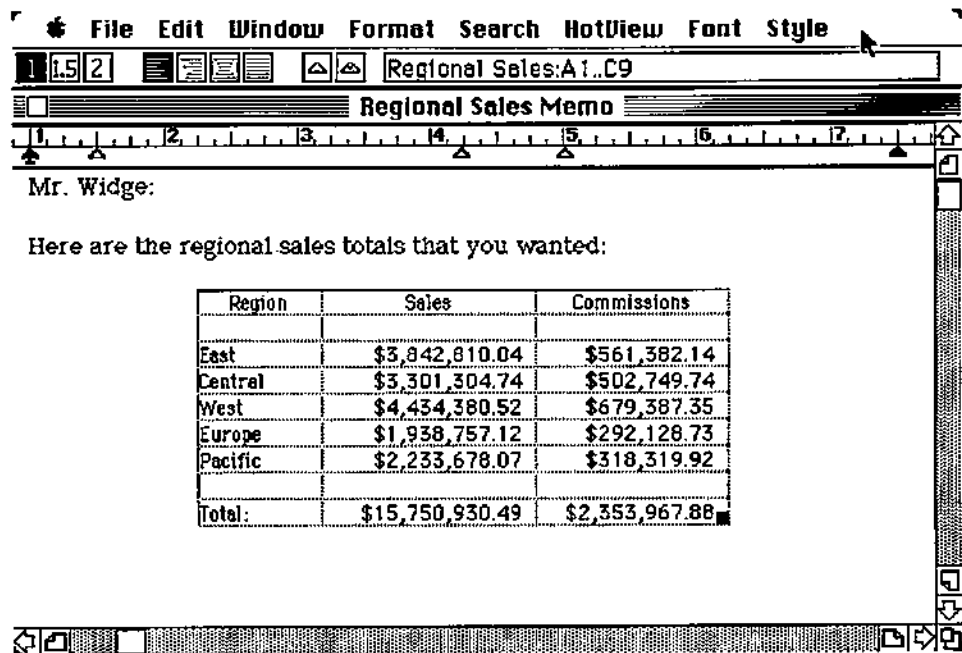


Figure 6.27: A HotView of figures from a worksheet.

The HotView of this worksheet range is somewhat different than what we got when we cut and pasted the same information through the Clipboard. With Cut and Paste, the columns of the worksheet became normal text, formatted according to the tab stops in the word processor. You could go in and edit the text however you wished—changing fonts, moving text, or altering figures.

The HotView still has the appearance it had as part of the worksheet. The columns are separated by grid lines and all of the cells have the same font and type style. You cannot move the insertion point into the chart to make changes.

The solid box around the chart tips off the major difference—the HotView is pasted into text as if it were graphics. When you move the mouse cursor inside the box, it assumes the same cross-hair shape it has in a graphics box. This shows that you can only move or change the HotView box as a unit.

**Moving and Changing HotViews** You move the HotView to the right or left by dragging on the edge of the box. As with a graphics

box, you cannot move the HotView outside the margins of the document, and you cannot move it vertically.

You can change the size of the HotView by dragging the square in the lower right corner. Unlike a graphics box, however, changing the size of the box does not stretch or shrink the text inside it. Instead, it expands or contracts the window through which you see the table. If you make the outline smaller, the text in the columns remains the same size, but you will see less of the table.

If there isn't enough room for all the columns of a worksheet or database in your word processor document, the HotView will include only the columns that will fit. You can, however, display the other columns by enlarging the document's margins, then dragging the square on the HotView box window.

If you click somewhere outside the HotView box, the outline disappears and the HotView becomes part of the text. The outline box is not printed as part of the document.

Note that if you include the grid lines on a worksheet or database, the top and left sides of this HotView will not have lines, as shown in Figure 6.28.

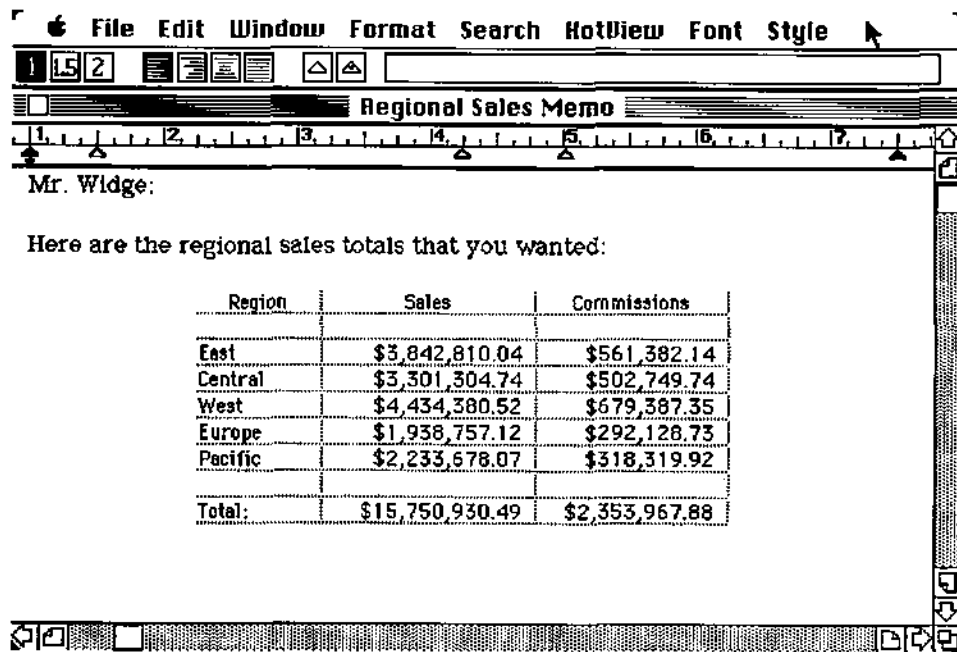


Figure 6.28: The worksheet's grid lines give a lopsided appearance to the HotView.

The solution is to remove the grid lines before you include them in a HotView in a word processor document. To do this, use the Hide Grid command on the Style menu in the Worksheet or Database window. Since the HotView changes to reflect the current state of the window it refers to, as soon as you remove the grid (even after you've included the HotView), the word processor version is also without lines, as shown in Figure 6.29.

This illustrates a basic principle of using HotViews: if you need to edit the chart or change its format, you have to go back to its original document. None of the normal editing commands within the word processor have any effect on this foreign object.

A graphics HotView acts much like a pasted graphics box. The dot in the lower right corner of the outline shrinks or stretches the graphics, rather than cutting off part of the window as it does in a worksheet or database HotView. In other words, a graphics HotView always shows the entire graph, no matter how far you stretch or shrink its dimensions. It looks just like a static graphics box, except that the HotView changes if you change the graph.

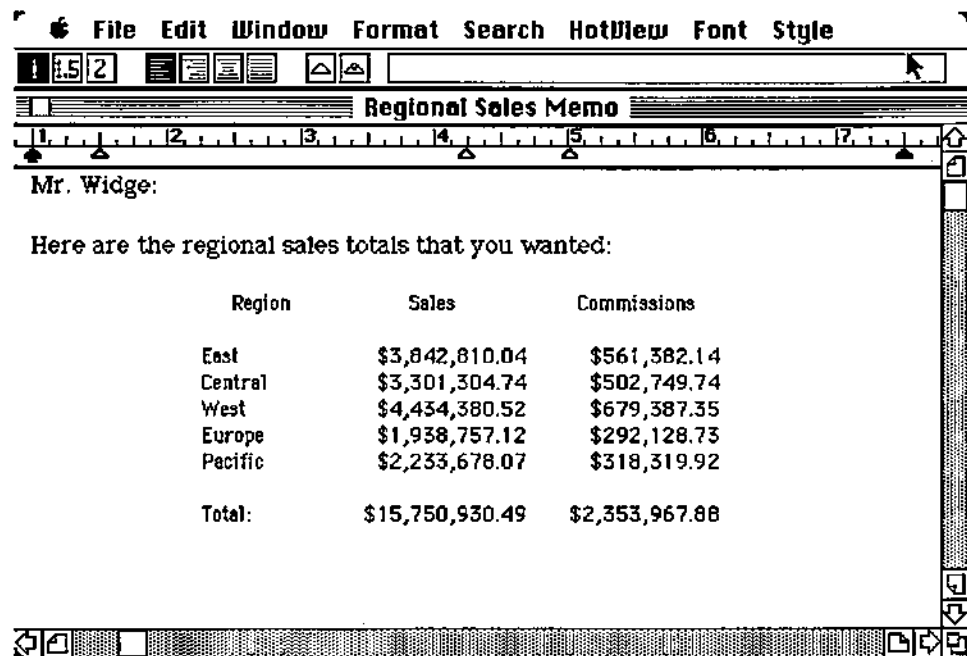


Figure 6.29: Without grid lines, the HotView looks more like a word processor table.



A graphics HotView is usually two steps removed from the actual data. The lines or bars in the graphics window are based on a reference to a series of figures in a worksheet or database. If you change the figures in the worksheet or database, the corresponding line in the graph changes. If you have the graph included as a HotView in a word processor document, the change in the worksheet or database will make its way through to the word processor text as well.

The only editing you can do on a HotView within the word processor is to mark it as a block and move it using the Cut, Copy, and Paste commands. Use the same technique to mark a HotView as you do to mark a graphics box. Click outside the HotView to turn off the outline box, then double-click the HotView to mark it. When you move this block, Jazz simply moves the reference so that it still refers to its original document.

**The Date and Time** The HotView menu also has a number of other items that do not draw information from other documents. These items include the current date, time, and page number.

The Macintosh contains a battery-operated clock that keeps track of the current date and time, even when you unplug the power. You can set this clock through the Alarm Clock and Control Panel desk accessories. See your Macintosh manual for details.

By choosing the Date item on the HotView menu, you can include the current date from the Alarm Clock. If you have set the clock accurately, this will be today's date, written out in its full American format: July 26, 1985. Since you have set this date as a HotView, the text will change if you look at the document the next day. When you print the document, it will always be marked with the current date. This is a great advantage for letters and memos, which often sit for a day or two before they are revised and sent.

You can also include the current time as a HotView. The time is written out to match standard American usage: 11:32 AM. Every time that you scroll through the window or switch to another window, the time HotView is updated. When you print the document, it will show the actual time of printing.

**Page Numbers** Another item on the HotView menu is Page, which inserts the current page number. This command is especially useful for including the page number in headers and footers.

The page number HotView keeps track of all page breaks, both those that you insert and the automatic breaks that Jazz adds when

the text gets too long for a page. Figure 6.30 shows the same line above and below a page break in a text. The line consists of the text. The page HotView follows the words *This line is on page*. The HotView automatically detects that the line below the page break is on page 2. If you later add lines to a page, the page break and the page HotView will adjust accordingly.

If you include a page HotView in a header or footer, the correct number will automatically appear. You might notice that the footer box appears to read just Page 1. However, the HotView will adjust to match the number of each page with a footer.

**Show Definitions** Normally, the date, time, and page HotViews show the actual information that they represent. Since they look just like other text, however, you may need a way to distinguish the HotViews quickly.

The Show Definitions item on the Hotview menu replaces the text HotViews with a word describing what they represent. For the time,

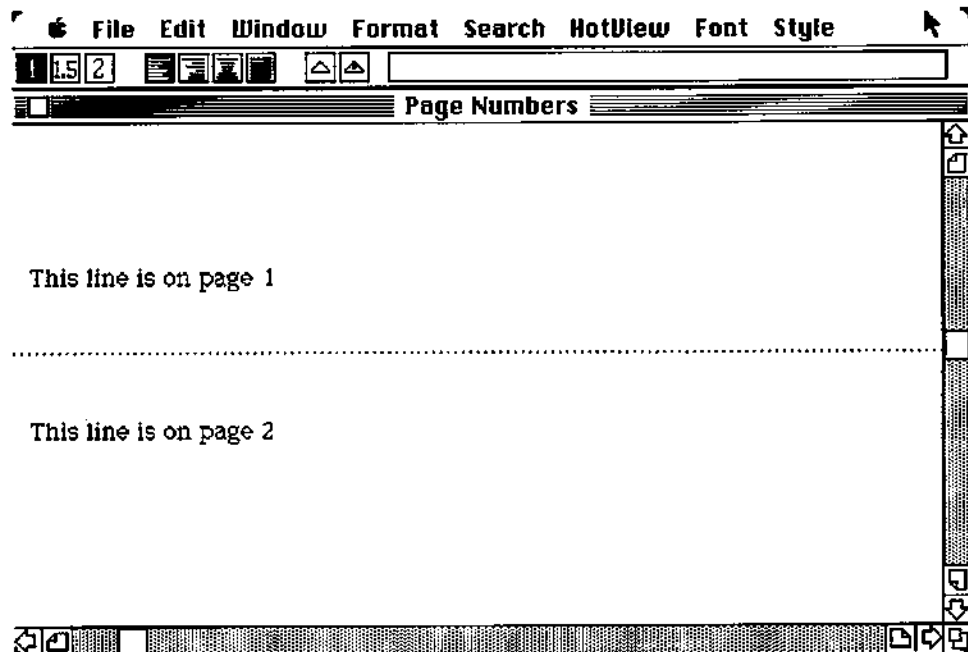


Figure 6.30: The page HotView lets you mark the text with the current page number.

for example, Show Definitions would change a HotView to the bold-faced word TIME. For example, I am writing this at **TIME**.

Make sure that you switch back to the other mode, Show Values, before you print the document. Otherwise, the boldfaced definition word will be printed where you expected to see the current date or time.

As with other HotViews, you cannot edit the date, time, and page markers, except to cut and copy them to another place. You cannot move the insertion point to a place inside one of these markers. If you try, you'll simply mark the whole HotView as if it were a block.

**Freezing a HotView** If you want to keep the HotView from changing any further, you can freeze it. The HotView menu has two commands for doing this: Freeze All, which freezes all the HotViews in a document, and Freeze, which locks only a specific HotView. The Freeze command only works if you have selected a HotView by clicking on it. Freeze All works anytime.

Why would you want to freeze a HotView? There are two good reasons.

One is obvious. Once you've finished with your document, you may want to freeze it so that it reflects the information that you had on that date. You might have composed an official memo, for example. Once you send it out, the memo is set, even if new figures come in. In that case, you would want to freeze all the HotViews in your file copy of the memo; otherwise, you might be accused of rewriting history by plugging in figures later than the date when you issued the memo.

The other reason has to do with the way Jazz organizes HotViews. A HotView is literally a window into another document, and it is not stored as a part of the word processor text. For that reason, the other document must be available whenever you use that word processor file (preferably on the same disk). Otherwise, Jazz would not be able to find the HotView's information when it needs it.

This means, for one thing, that you must be very careful not to delete files that may be used by other documents as HotViews. If you do, you will erase the information that the other document is relying upon, leaving a blank hole in the other document.

Another problem that this causes involves the computer's memory. Whenever you have a HotView, Jazz must read in the document you are using plus every other document you reference. If you

have a graphics HotView, for example, this may mean that Jazz will need to load the graphics document and the database or worksheet it is based upon, as well as the word processor document.

Jazz does this all automatically. From your standpoint, it looks as if the HotView document is actually included in the document.

In the computer's memory, however, all the different documents are taking up space. If you're using Jazz with large documents, memory can become very scarce. If so, you can gain a big advantage by freezing HotViews, removing the need for all the other documents.

When you freeze a HotView, you change it into a fixed graphics image. If it's a graphics HotView, the effect is just as if you had transferred the graph using the Cut and Paste commands.

You can still move or resize the graphics box using the cross-hair shaped cursor. Cut and Paste work just as they do with pasted graphics—double-click to mark the block, cut to the Clipboard, then paste in the new place.

If the HotView is of a worksheet or database, freezing makes a subtle change as it converts the table into a graphics box. Before freezing, if you resized the HotView box, you did not change the size of the text—you merely changed the number of rows and columns that you could see through the window. After you freeze the HotView, however, the table becomes like any other graphics box—the text will be squeezed or stretched to match the dimensions of the box. The results are usually not attractive.

Note that freezing a worksheet or database HotView does not have the same effect as cutting and pasting the same information. A frozen HotView is displayed as graphics and cannot be edited. A cut and paste transfer, on the other hand, yields text that can be changed or edited like any other text.

Make sure that you change any formatting features in the table before you freeze it. If you want to turn off the grid, for example, you should go into the Worksheet or Database window and do it now. Once you freeze the HotView, you will no longer be able to change any formatting features.

You can also freeze the date, time, and page HotViews. Make sure you choose Show Values before you freeze these HotViews because, if you choose Freeze with the definitions displayed, the definition, not the value, will become the permanent part of your text. After you have frozen these HotViews, they become normal text, and you can use normal editing commands on them.

**Printing** The word processor's File menu offers two different types of printing:

- **Print Document** simply prints the text as it is, including graphics and HotViews.
- **Print Merge** prints multiple copies of a document, using a system suitable for form letters.

**Standard Document Printing** Print Document is the standard way that you'll print your text. It generally prints a single copy of the text, using whatever settings you choose for your printer. If you want multiple copies or only certain pages, you can ask for that on the prompt box that appears when you print.

As in the other modules, you can set some aspects of the page format by choosing the Page Setup command from the File menu. The word processor's Page Setup box is the same as the box for the other Jazz modules, except that it doesn't include boxes for the header, footer, and margins. All these options are set by the more flexible options within the word processor itself.

**Merged Printing** The Print Merge command lets you do another type of printing. With merged printing, you use a standard document as a template for printing multiple copies with minor changes in each. The most common application of merged printing is a form letter that you want to address to many different people. Usually, you'll want the text to stay the same, but you'll want to insert each recipient's name in the address and salutation.

The word processor's HotView menu has a Merge Field that lets you link your document to records in a database. The merged field places a HotView reference in the text, which is filled in by the appropriate information from each database record at the time the document is printed.

Most commonly, you will link the form letter to an address list database. Figure 6.31 shows the address list that Widgenco's West region's sales manager might be keeping for his salesmen. It includes fields for last and first name, a Mr or Ms abbreviation, street, city, state, and ZIP code. (The MrMs field is necessary for the letter's address and salutation.)

File Edit Window Query Sort Report Font Style

Last Name: Allen

1

Address list

|    | Last N... | First N... | MrMs | Street                | City          | State | Zip   |
|----|-----------|------------|------|-----------------------|---------------|-------|-------|
| 1  | Allen     | Thomas     | Mr   | 1521 Eleventh St.     | Berkeley      | CA    | 94703 |
| 2  | Alpers    | Nancy      | Ms   | 555 Mission St.       | San Francisco | CA    | 94111 |
| 3  | Callahan  | MaryEllen  | Ms   | 1 Sunset Blvd         | Hollywood     | CA    | 90731 |
| 4  | Dixon     | Ronald     | Mr   | 123 Silver St         | Reno          | NY    | 89401 |
| 5  | Elliot    | Harry      | Mr   | 543 23rd St.          | Fresno        | CA    | 93100 |
| 6  | Ellis     | Paul       | Mr   | 2323 41st St.         | Portland      | OR    | 97300 |
| 7  | Freud     | Lawrence   | Mr   | 1 Century Blvd.       | Los Angeles   | CA    | 90200 |
| 8  | Glenn     | Edward     | Mr   | 10 Jack London Square | Oakland       | CA    | 94601 |
| 9  | Griffon   | Harold     | Mr   | 123 Main St.          | Phoenix       | AZ    | 85901 |
| 10 | Mitchell  | Carl       | Mr   | 100 Height St         | San Francisco | CA    | 94117 |
| 11 | Moore     | Dorothy    | Ms   | 555 Wilshire Blvd     | Los Angeles   | CA    | 90045 |
| 12 | Santos    | Paul       | Mr   | 999 First St.         | Seattle       | WA    | 98071 |
| 13 | Whitman   | Mary       | Ms   | 545 Redwood Ave.      | Eureka        | CA    | 95300 |

Figure 6.31: Widgeco's West region sales manager uses this address list for his form letter mailings.

You insert a merged field much like any other HotView. Switch first to the Database window and choose a field name. Then go back to the Word Processor window and place the insertion point where you want the field to appear. Choose Merge Field off the Hot-View menu. The screen will show the contents of that field in the first record in the database.

You can pick and choose which records in the database you want to receive the letter. If you mark only one record or one series of records, only those people will be sent copies of the letter.

You can also base merged fields on ranges in a worksheet. If you name the field as a single-column range, the column acts like a field in a database. If you mark a range confined to a single row, the merged printing will take its successive values from each row across. You can even mark a merged range that consists of several rows and columns. In most cases, though, that won't make sense, since the separate columns will usually correspond to different types of information, rather than a single item that could usefully define a field.

You'll need to repeat this procedure for each merged field you insert. In addressing a form letter like the one shown in Figure 6.32,

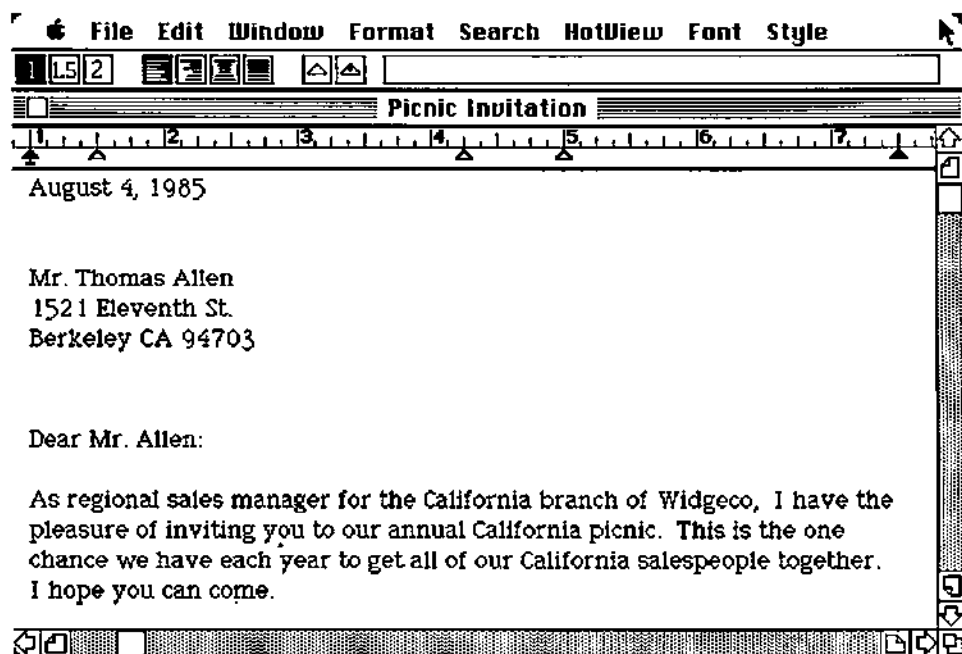


Figure 6.32: An example of a form letter with merged fields.

you may need to set up ten or twelve merged fields. Each one will show the appropriate information for the first record in the database.

To see what you're doing, choose Show Definitions on the HotView menu. This changes the merged fields to boldfaced markers showing which fields they represent, as in Figure 6.33. You can see that the address block doesn't represent a single addressee, but instead names a whole field of items, each representing the appropriate information about each person. Switch back to the actual names with the Show Values command before you print the letter.

A database query can also be used to select records for a merged mailing. For example, Widgeco's sales manager wants to send his letter only to the salespeople in California, not the others in the West region. He would go first to the Address List database and use a query to find all the records where the State is CA. This query finds 9 of the 13 records.

To print the form letter, return to the Word Processor window and choose Print Merge. Jazz calls up its usual dialog box, asking you what type of printing, what page to start on, and so forth.

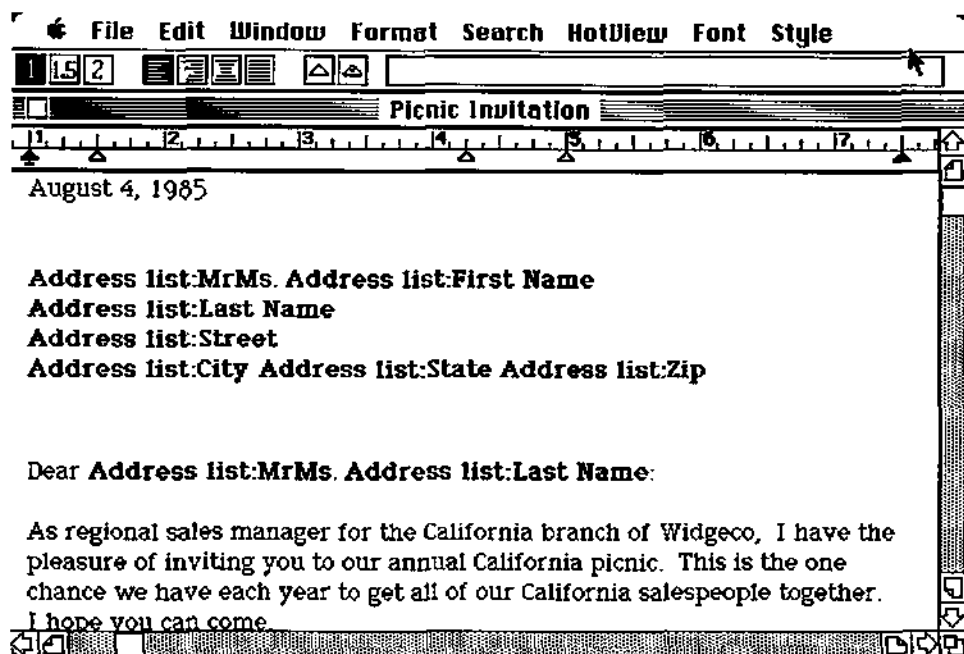


Figure 6.33: The same form letter, showing the merged field definitions.

You should answer these questions as you normally would. Don't add an extra number to the Copies box—1 copy means to make one copy for each addressee.

When you click OK to start the printing, Jazz goes through each record you have picked from the database and prints one copy of the letter with each merged field filled by the appropriate piece of information. In the case of the Widgeco manager's letter, Jazz will print nine copies (one for each record selected by the query), with each copy addressed to the specific individual.

**S**ummary Jazz's word processor provides a simple tool for writing memos, letters, and reports.

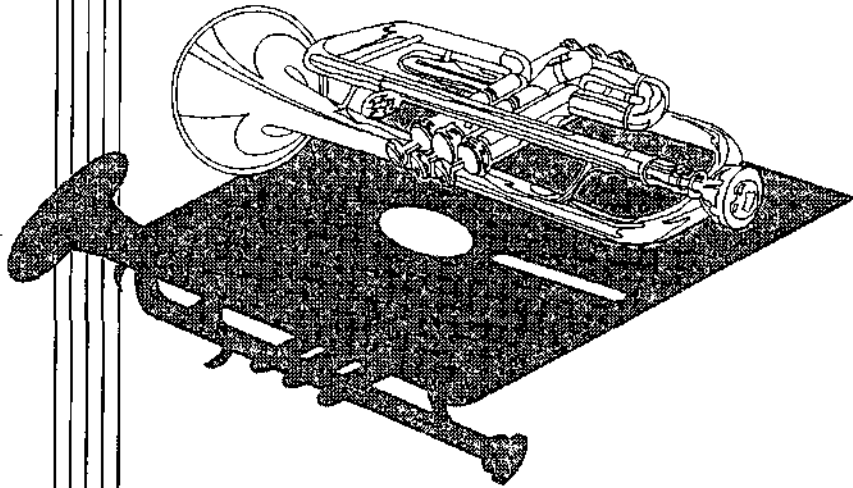
You do basic editing operations with the mouse. You use it to move the insertion point and mark blocks for cutting and pasting. The Backspace key lets you back up and correct errors. You use the



Cut, Copy, and Paste commands to move and copy blocks of text. The Find and Replace commands let you search through your text and make changes throughout it.

A ruler line controls the formatting of each area of the text. You can set various options, including line spacing, justification, tabs, and margins. To arrange the page layout, you can add page breaks, headers, and footers.

The word processor is fully integrated with Jazz's other modules. You can cut or copy text and graphics from any other window and paste them into your word processor document. In addition, you can include HotViews of Worksheet, Database, and Graphics windows—insertions that remain linked to the original document so that they will change to reflect subsequent changes in the original data.



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# COMMUNICATIONS

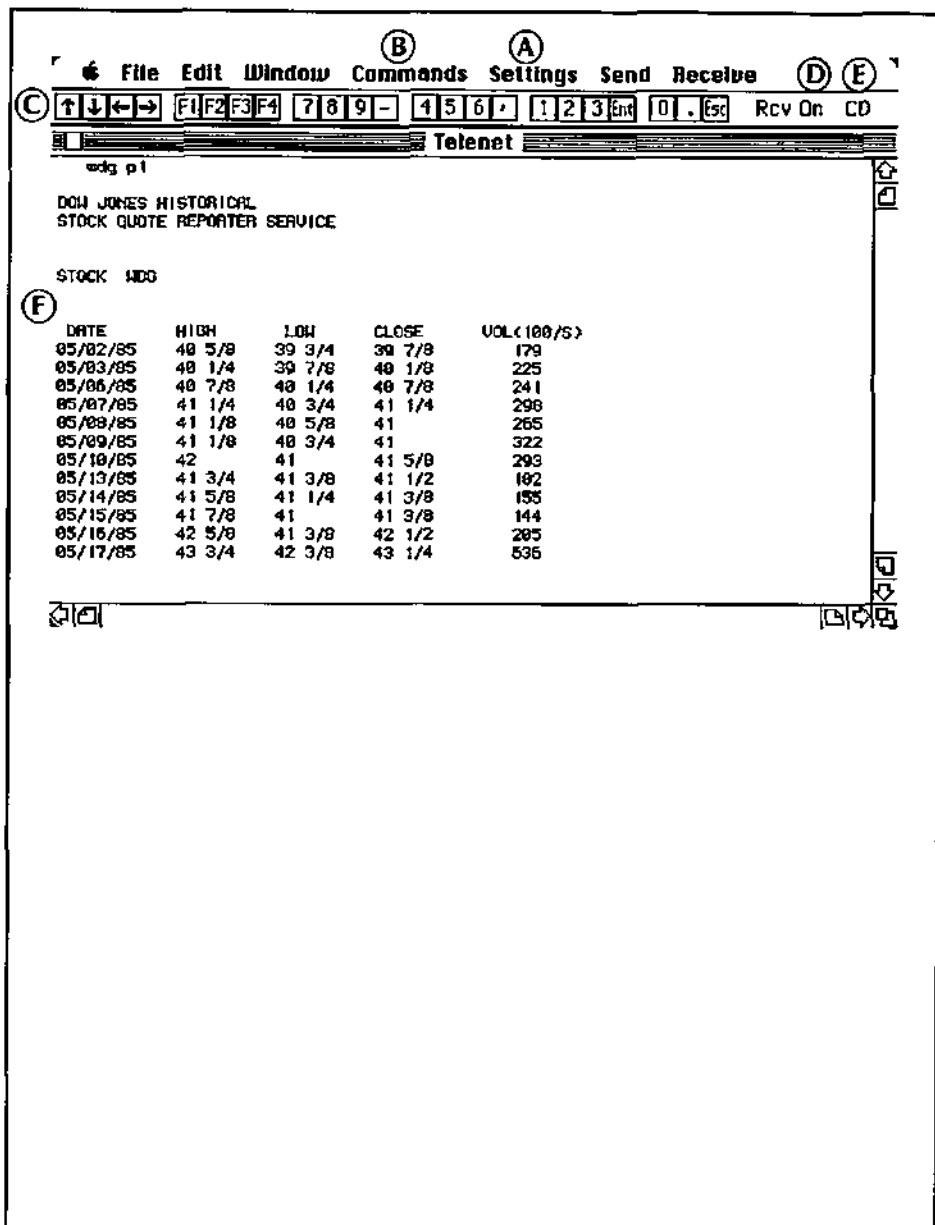
# 7

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**INTRODUCTION** Jazz's communications module lets your Macintosh talk with another computer. You can use this module to retrieve information from a commercial communications network or to exchange files with another computer.

You'll need some special equipment to use Jazz's communications module—usually a special cable and a modem to connect the computer to your telephone line.

# COMMUNICATIONS SAMPLE SCREEN



## **K** KEY TO THE SAMPLE PAGE

The screen on the facing page shows an example of a communications session on the Dow Jones News/Retrieval network. A WidgeCo executive is using Jazz to check the recent performance of Widgeco's stock.

The Communications window has the following special features:

- Ⓐ Settings for all terminal emulation, data transmission, and modem characteristics.
- Ⓑ Commands to dial, answer, and hang up automatically.
- Ⓒ Console line buttons that simulate keys on the standard VT-100 terminal's numeric keypad.
- Ⓓ An indicator showing that Jazz is capturing incoming messages into a disk file.
- Ⓔ An indicator showing that the modem has detected a carrier signal for communication over the telephone line.
- Ⓕ A full 24-line by 80-column terminal screen emulator that you'll use for all telecommunications work.

## CREATING THE SAMPLE PAGE

The Dow Jones network's historical quotes system automatically retrieves listings of the stock quotes for each trading day. To use this system, you need to pay a subscription fee to get a user's ID and password. We'll follow the WidgeCo executive who wants to check the recent quotes for his company, using the popular Hayes 1200 baud modem.

Before he can use the communications network, the WidgeCo executive must set up his modem and cables. Then, he must select from the choices on the Settings menu, shown in Figure 7R.1. Normally, he would need to choose the first two choices to set the terminal and transmission type. But for a connection by a 1200-baud modem to the Dow Jones network, the default settings are exactly what he wants, so he can just leave them alone.

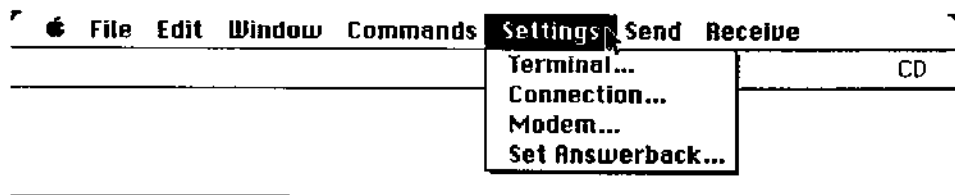


Figure 7R.1: The Settings menu.

To use the automatic dialing features of the Hayes modem, the WidgeCo executive must choose the Modem command, which brings up the Modem Settings dialog box shown in Figure 7R.2. The default is for a Hayes modem on a touch-tone telephone line. The executive types the telephone number of the network's access line.

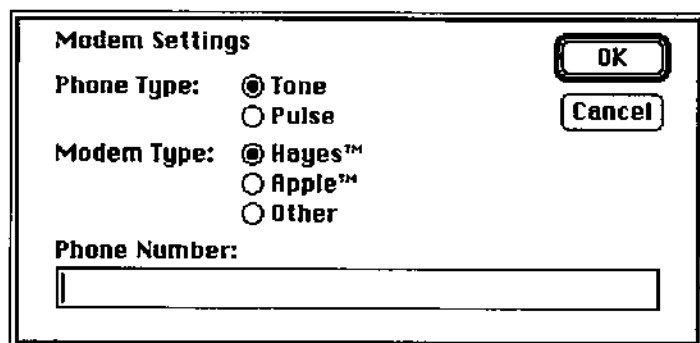


Figure 7R.2: The Modem Settings box.

The executive now chooses Dial from the Commands menu. Lights flash on the modem, and the modem dials the number automatically. When it has established the telephone connection with the other computer, the modem types the word

#### CONNECT

inside the Jazz window. The executive presses Return a few times to get the other computer's attention, then goes through its logon procedure. The procedure involves typing an ID number and a secret password that verifies that he is a paying customer.

Our executive wants to use the stock quotations in other work with Jazz, so he uses the Receive menu to capture the incoming data as a disk file. He first chooses Set File on that menu to choose a file name, then chooses Start on the same menu. Jazz responds by turning on the Rcv On indicator. Later, he can work with this information as a word processor file or transfer it into a worksheet or database.

Once he is inside the Dow Jones network, the WidgeCo executive types

#### //HQ

to reach the Dow Jones historical quotes system (it is "historical" in the sense that it retrieves stock prices from past trading days). He then types his query to the network:

**wdg p1**

The *wdg* is the hypothetical stock market code for WidgeCo. The *p1* is a code that tells the Dow Jones network to retrieve the prices for the last 12 trading days.

Once he has got the information that he wants, the executive types the command

#### disc

to disconnect himself from the network (and to stop paying for its time). He then chooses Hang Up from the Commands menu to tell the modem to hang up automatically. His communication session is over.







Jazz's communications application lets you use your Macintosh to communicate with another computer. This feature can be very useful for many business purposes, such as:

- Using your Macintosh as a terminal with a large corporate computer
- Using a commercial communications service such as The Source, CompuServe, MCI Mail, or the Dow Jones News/Retrieval Service
- Using a local computer bulletin board service
- Exchanging files with another Macintosh or with a different type of computer.

To Jazz, these types of communications are the same. All it has to do is send information out through one of the connectors on the back panel of the Macintosh into a cable of some sort. If you have made all the proper connections, the other computer will accept the information and send its transmissions back over the same wires. Jazz will then accept the incoming data and display it on the screen. You can also capture incoming information as a disk file.

The most common way to communicate with other computers is through a **terminal**. Large corporate computers and communication services are usually designed with one central processor at the hub of a network of wires radiating out to many different workstations. Traditionally, these remote workstations have been dedicated terminals that have a keyboard and a screen but no independent computing power.

With Jazz's communications application, you can make your Macintosh emulate one of these terminals. In a way, this is a step down for your Macintosh—as a terminal, it uses its computing power only to send and receive characters and to arrange them on the screen. The advantage, however, is that Jazz can make the Communications window act exactly the way the large computer expects it to act. Since large computers are organized around this idea of a *dumb terminal*, your computer has to communicate with them on that level. And, if you use the fancier features of the Jazz communications application, you can do some additional things that no dumb terminal could think of, such as capturing data on disk or incorporating data into a worksheet.

The other way you might use the communications application is for file transfers. You can dial up another computer and send a

whole file of information. You might, for example, have a worksheet that you want to send to a branch office on the other side of the country. You could save it on disk and put the disk in the mail, but that might take several days. It would be much faster to have your computer in the branch office. Most communications programs use a standard protocol to check for transmission errors in the file being sent, so you usually don't have to worry about sending incorrect data.

The other computer you're communicating with doesn't have to be a Macintosh running Jazz. The communications application uses a standard system for encoding text data, so that virtually any computer running any communications program can accept the data. If your branch office has an IBM PC running Lotus's Symphony, for example, you could exchange worksheets and convert them with little difficulty.

If both offices have a Macintosh with jazz, you're even better off. Jazz has a special communications system for talking to another Jazz program. With this special system, you can transmit complete jazz files, including graphics and formatting information.

File transfers are more complex than terminal emulation, because they require special preparations on both the sending and receiving computers. We'll start by talking about terminal emulation and get back to file transfers at the end of the chapter.

**The Basics** Telecommunications can seem bewildering and frightening to many computer users. This is understandable since this type of communication involves invisible data sent in coded form to a mysterious computer far away—it's hard to imagine a concept that can't be confined inside a nice, square box. Also, telecommunications invariably involves a rat's nest of cables that need to be wired in specific (and obscure) ways. If you make any mistake in the wiring or the software, the computers will not be able to talk to each other.

The computer industry intimidates people still further by its complex vocabulary of words like *data bits*, *parity*, and *full duplex*. These words make perfect sense to the electrical engineers who thought them up, but they have little to do with the real problem of getting information from here to there and back again.

Bear with it for a moment. The ideas are not as complicated as they sound.

**Setting Up** Before you can start using the communications application, you'll need the right equipment. For the basics, you'll need three things:

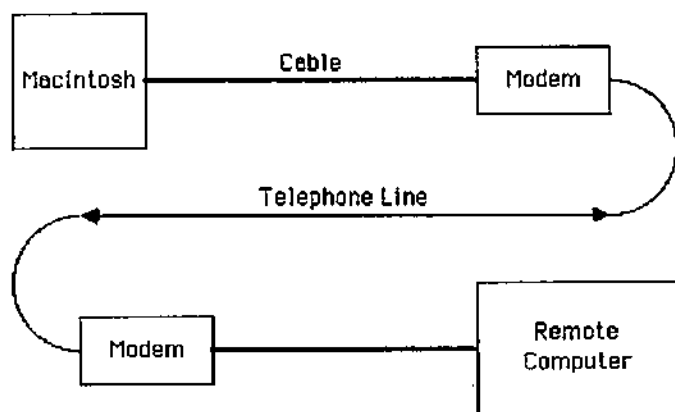
- A modem, which converts the computer's electronic signals into a warbling sound that can be sent over a telephone wire.
- A cable that connects the modem to the back of your Macintosh.
- A telephone line that you can connect to your modem. You can use your regular telephone line unless you want to carry on voice and computer conversations simultaneously. You don't need to install a special modem line.

The word *modem* is short for *modulator/demodulator*, which shows that this device functions in two directions. A modem modulates the signals that your computer is transmitting, so that they can be sent over the telephone. At the same time, it listens to the signal coming back over the line from the other computer and demodulates that signal into electronic impulses that your computer can receive. In most cases, the telephone line can carry signals in both directions simultaneously.

In using the modem, you'll dial a telephone number that is connected to the computer that you want your Macintosh to talk to. The other computer will normally also be tied to a modem, which decodes the warbling sound back into electronic impulses for the other computer and encodes the other computer's transmissions back to your computer. Figure 7.1 shows a typical setup at both ends of the telephone line.

Jazz explicitly supports two popular modems: the Hayes Smartmodem and the Apple modem. Both of these modems have many advanced features, such as auto-dial and auto-answer. With auto-dial, you can have Jazz send a command directly to the modem to have it dial a telephone number and establish a connection automatically. With auto-answer, you can set the modem to answer incoming calls automatically and set up Jazz to record the information. Auto-answer would be quite useful if you expect a branch office to dial up your computer when you're not around.

With either a Hayes or an Apple modem, you may need to set some switches inside the case. These switches affect the way the modem responds to commands from the computer. On the Hayes modem, these switches are inside the front panel; on the Apple modem, they are on the back panel. The switches should



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**Figure 7.1:** *How you'll set up your modem and cables.*

be left as they are set in the factory, except for switch 6 on the Hayes modem and switch 1 on the Apple modem, which should be up instead of down. If you want to use the auto-answer feature on the Hayes, push switch 5 up as well. Read your modem manual if you don't know how to set these switches.

You can use almost any other modem as well, but you may not be able to take advantage of all of its features. You may, for example, have to type a special code to tell it to dial a number, and you may not be able to use the commands to answer and hang up the phone. At the very worst, you'll just have to dial the numbers yourself, then turn on the modem when you make the connection. The modem will still work once you've established the connection.

The cable between the computer and the modem can be the source of much trouble. Computer manufacturers have never been able to agree fully on a comprehensive standard for connections of equipment. Virtually all modems and computers adhere to a broad RS-232 standard, but there are many variations within the standard. As a result, it can often happen that two RS-232 machines will not succeed in talking to each other over a standard RS-232 cable.

The Macintosh uses one of the stranger variations of the standard RS-232. Instead of the long 25-pin plug used by most RS-232 machines, the Macintosh uses a smaller nine-pin plug at its end. Most modems use the 25-pin connector. As a result, you'll need a special cable to connect the nine pins on the Macintosh to the

proper pins on the modem. (The Apple modem also uses this non-standard nine-pin plug.)

The safest bet is to buy a cable at an Apple dealer. Tell the salesperson exactly what type of modem you're using, and make sure you can bring the cable back if it doesn't work.

If you're an enterprising type, you can save money by making your own cable, but you shouldn't attempt this unless you know what you're doing. Read Joe Campbell's book *The RS-232 Solution* (SYBEX, 1984) before you try.

The nine-pin connector will fit on either of two ports on the back of the Macintosh. You'll generally want to use the one labeled with a telephone symbol; the other port is for the printer. You can actually use either port, since they're almost identical internally. However, the telephone port is somewhat more reliable for high-speed transmission because it includes some additional circuitry for controlling the transfer.

On the other side of the modem, you'll need to attach your telephone cable. Most modems, including the Hayes and Apple models, are of the direct-connect type, which means you plug the telephone wire directly into a hole on the modem. For this type of modem, you must have a modular telephone plug on your telephone (this is standard on most telephones installed within the last 15 years). If you don't, you'll have to have your telephone wire converted by a telephone company.

A few modems are of the acoustic coupler type. With these modems, you press the telephone handset directly into a cradle on the modem. The modem sends and receives its sounds through a speaker in the cradle into the telephone itself. This type of modem requires no special wires, but it is less reliable than the direct-connect type.

**Communication without Modems** Not all computer communications involve modems. In some corporations, for example, a mainframe computer will be attached to a network of hard-wired terminals and computers. These remote computers have a cable running directly from their output port to the main computer's input port. If you have such a network, you can send information directly over these wires to the main computer without using a modem to translate the electronic signals into sounds and back again.

Another example of communication without modems involves file transfers between two computers. If you have an IBM PC in

your office and a Macintosh running Jazz, you could string a cable directly from one computer to the other and transfer information directly between the machines, as illustrated in Figure 7.2. This eliminates the problem of transferring data between two machines that cannot read each other's disks.

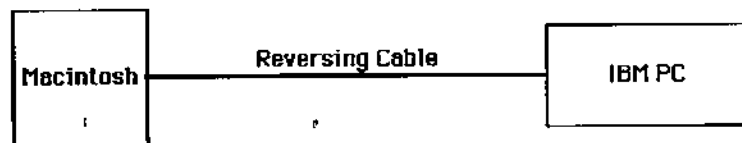
A word of caution, though: You cannot use the same cable to connect two computers as you can to connect a computer to a modem. Connecting two computers usually requires a reversing cable that switches the transmitting and receiving lines between the two ends. The reason for this is complicated, and the kind of cable you'll need depends a lot on your system. Explain your needs to your computer dealer.

**The Communications Window** You prepare Jazz for telecommunications by opening a Communications window. Choose New from the File menu, click the Communications icon, and a window opens.

Figure 7.3 shows the initial screen of the Communications window. The window is completely blank, but otherwise resembles any other Jazz window.

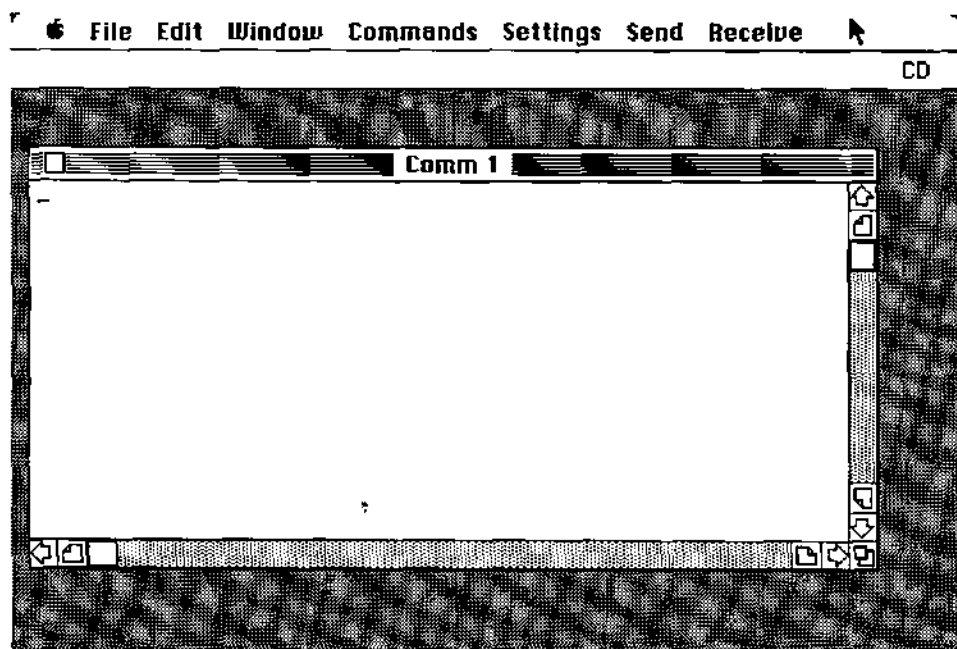
Some parts of the menu bar are also familiar from the other modules. The Apple, File, Edit, and Window menus are essentially the same as in other modules. You will probably want to use the Zoom Up command on the Window menu because most communications work requires a full-screen window.

The console line is blank for the moment except for the letters **CD**, which stand for *carrier detect*. These letters are like a light that comes on whenever the modem is connected to another computer. They also turn on when the modem's power is off.



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**Figure 7.2:** A system connecting two computers without a modem.



**Figure 7.3:** A new Communications window.

In some cases, the CD indicator will always stay on, even when the modem is on and not connected to a telephone line. With a Hayes modem, this probably means that switch 6 is down rather than up. With an Apple modem, switch 1 may be down instead of up. Check the switch or just ignore the indicator. It doesn't hurt anything as long as it's not off when you want it to be on.

Although the Communications window looks like any other Jazz window, it acts somewhat differently. By exploring these differences, you'll discover some of the important features of telecommunications.

If you try typing something, you'll discover the first major difference: the characters do not appear on the screen. There is a flashing underline cursor (the equivalent of an insertion point), but it doesn't seem to do anything.

In most communications, the Editing window is controlled by the other computer. When you type a character, Jazz sends it out over the wire, but it does not display the character on the screen. Instead, it displays only the characters that the other computer sends back. Usually, the other computer is set up to echo the characters it receives back over the telephone line so that you do see

them on the screen (since you aren't hooked to another machine right now, the characters you type can't be echoed).

You can turn on a local echo and have Jazz display the letters that you type. In most cases, however, that would lead to your seeing two copies of each letter (Ilikkee tthhiiss)—one from the local echo and one from the other computer.

In general, the mouse does not work in a Communications window. You cannot move the cursor to another point on the window by clicking. You can mark a block by dragging, but that has no effect on the actual transmission.

The only reason to mark a block is to copy text to the Clipboard. The Paste command does not insert text on the screen; it merely sends the contents of the Clipboard out to the other computer as part of the stream of data.

You cannot cut text out of the window or change it in any way except by typing. The Cut, Undo, and Clear commands on the Edit menu are disabled.

The lesson of all this is that the Communications window acts like an old-fashioned dumb terminal under the complete control of the other computer. Standard terminals do not have fancy editing commands like Cut and Undo, and they can't position their cursor with a mouse. They are limited to displaying what the other computer wants them to display. Since a dumb terminal is what a Communications window is imitating, it has to act in the same unenlightened way.

The editing capabilities you will have in a Communications window depend on how the computer at the other end treats the terminal screen. Some computers treat the Communications window as if it were the most rudimentary of terminals, the old-fashioned teletype. Other computers can use special features of the more sophisticated computer terminals. We'll get back to the subjects of editing and terminals later in this chapter.

As far as Jazz is concerned, the text in the Communications window is meaningless. Once the text scrolls out the top of the window, it is lost forever.

If you choose the Save command on the File menu, you do not save the text inside the Communications window. You merely save the changes you have made on the Settings menu—the type of terminal you are using, the number you want to have your modem dial, and so forth. You could even create one Communications window for each type of connection you would want to make, and then use the same file over and over. You would not need different settings just because the window would have different contents.



There's yet another way in which a Communications window is different. You can only have one Communications window open at a time for each of the two output ports (one for the telephone port and one for the printer port). Each Communications window is linked directly to one of the ports, and you cannot link another one to that port until you close the first one. If you have a Communications window open for the telephone port and then open another, the second window will automatically be set for the printer port. After that, Jazz will refuse to open any more Communications windows until you have closed one.

You can think of the Communications window as a miniature computer terminal in itself, which is attached directly to the telephone port without having anything else to do with the Macintosh. Later, you'll find you can use the Communications window to accept text into other Jazz windows or to save incoming messages on disk. For now, however, just think of the window as a detached terminal.

To summarize, a Communications window is not a normal editing window. Editing is controlled by the other computer, not by Jazz, and the text in the window is not saved as a Jazz document.

**The Settings Menu** There's one unfortunate detour you must make before you can use Jazz to communicate with other computers. That detour is the Settings menu, which leads to four dialog boxes with choices that you have to make to describe how you want Jazz to send your signals.

This is the part of computer communications that smacks of mumbo-jumbo. It is unfortunate, but the industry has a bewildering variety of conflicting systems of data transmission. The only way you can get two computers to talk to each other is to tell each of them exactly what system you're using. And for that, you need to arm yourself with some background information.

The basic rule is that both computers must be using exactly the same settings. If you are talking to a corporate computer that transmits data with one group of settings, you should set Jazz to use the same settings. If you then log onto a network that uses other settings, you must change Jazz to match. If you are exchanging files with a friend, you must both agree to use the same system.

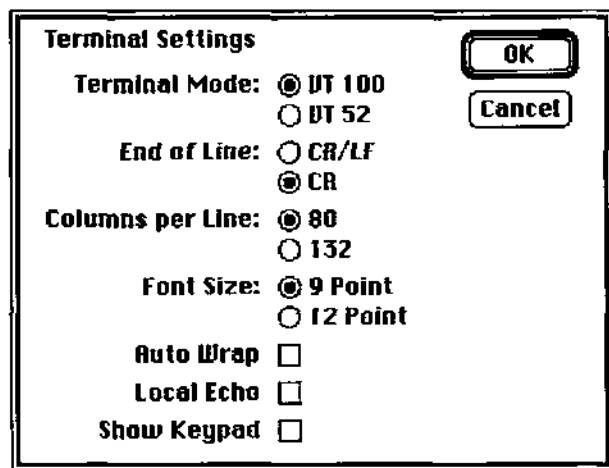
**The Terminal Settings** If you choose the Terminal option on the Settings menu, a dialog box, such as the one shown in Figure 7.4, will appear. This box gives a number of options about the type of terminal you want Jazz to emulate.

The most important of the options in this box is the first, Terminal Mode. This option describes what kind of terminal Jazz is going to pretend to be when it talks to the other computer.

Terminal emulation is an important feature. Without it, you and the other computer can only send messages back and forth one line at a time. Editing is limited to the Backspace key, which goes back and corrects a previous character in the line you are typing.

With a terminal emulator, however, you can let the other computer control the entire screen (or, more correctly, the entire Communications window, which acts as if it's a screen). Most terminals have special codes that let the other computer clear the screen, move the cursor up, down, left, or right, and place characters in arbitrary locations. These special codes let the other computer arrange text as it needs to on your screen. For a mainframe word processor, for example, this is almost essential, since you'll often want to go back to earlier parts in your text.

Jazz emulates two common terminals made by Digital Equipment Corporation (DEC): the VT-100 and the VT-52. The two are quite



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**Figure 7.4:** The Terminal Settings options.

similar, but the VT-100 is more powerful and more common. Most mainframe computers support a VT-100 terminal. It is common enough, in fact, to be a kind of standard. Many other types of terminals are designed to emulate a VT-100 just so they can be compatible with all the computers that use that terminal.

If you're talking to a computer that uses a VT-100, you're in business. Just leave the setting as it is, and press OK. Jazz will let its Communications window act just as if it were the DEC terminal, and the mainframe computer's software can take advantage of all the special codes it would use in communicating with that terminal.

It's rare that you'll have an occasion where you'll need to use the VT-52 emulation in place of the VT-100. There are some mainframe programs, however, that will only work with the VT-52, so you should choose that if you know you need it.

A more likely event is that you may need to talk to a computer that expects a terminal other than a VT-100 or VT-52. This is particularly true of IBM mainframes, which tend to expect an IBM terminal such as the IBM 3278. In most cases, those computers will have a program that lets a VT-100 terminal act like an IBM terminal. If that's true, you can let Jazz emulate a VT-100 and then have the mainframe computer pretend your VT-100 is emulating an IBM terminal.

The most common case of all, however, is that you'll be talking to a computer that doesn't expect a terminal at all. Most communications networks, including The Source and Dow Jones, act as if they were talking to a lowly teletype. Many other computers assume this as well, except for those using specific programs that take advantage of more sophisticated terminals.

If that's the case, you can set Jazz to act like either a VT-100 or a VT-52. Teletype-style transmission is so simple that it can be understood by any terminal; it avoids all the special features that make one terminal different from another. The other computer will send only those codes that are generally understood.

The rest of the options in the Terminal Settings box are less important. They deal mostly with options on how the text will be displayed on the screen:

- **End of Line.** Most communications systems expect you to end each line only with a carriage return character. The other computer automatically supplies the line feed that moves the text up a line on the screen. Occasionally, however, you will find that your computer is talking to a computer that doesn't automatically move the text up the screen, but merely moves the

cursor back to the beginning of the current line when you press Return. If that is the case, choose CR/LF for carriage return and line feed.

- **Columns per Line.** Almost all video terminals are designed to show 80 characters on each line. Since you're emulating such a terminal, you will probably want to keep it set for that. You can choose 132 characters if you need longer lines, but if you do, you'll have to put up with the window scrolling back and forth horizontally.
- **Font Size.** Jazz's communications application uses 9-point Monaco as its default font. That's a good choice, since it allows you to see the entire 80-column line inside the Communications window (provided you use the Zoom Up command to make the window the size of the entire screen). You can choose 12-point Monaco if you want larger type, but you won't be able to see the whole terminal screen. This option is the closest thing you'll get to a Font menu in the communications application. You cannot use any font except Monaco.
- **Auto Wrap.** You can have Jazz automatically send a carriage return if you type a line that is too long for the screen. The default is to have no wrapping, since most terminals do not have this feature.
- **Local Echo.** In most communications work, you let the computer at the other end of the line echo your letters back to you. Occasionally, however, you may find the other computer is not echoing your typing. Turn on Local Echo to have Jazz display your letters in the Communications window as you type them. (This is often necessary when communicating with another small computer that doesn't have facilities for echoing incoming transmissions.)
- **Show Keypad.** The Macintosh keyboard is similar enough to the VT-100's that they can be used interchangeably. The VT-100, however, also has a numeric keypad with numbers, arrow keys, and function keys. Jazz lets you display buttons for these additional keys along the console line, as shown in Figure 7.5. This is essential if you're using a program that takes advantage of VT-100 emulation. If you have the optional numeric keypad for your Macintosh, you won't need this display, since

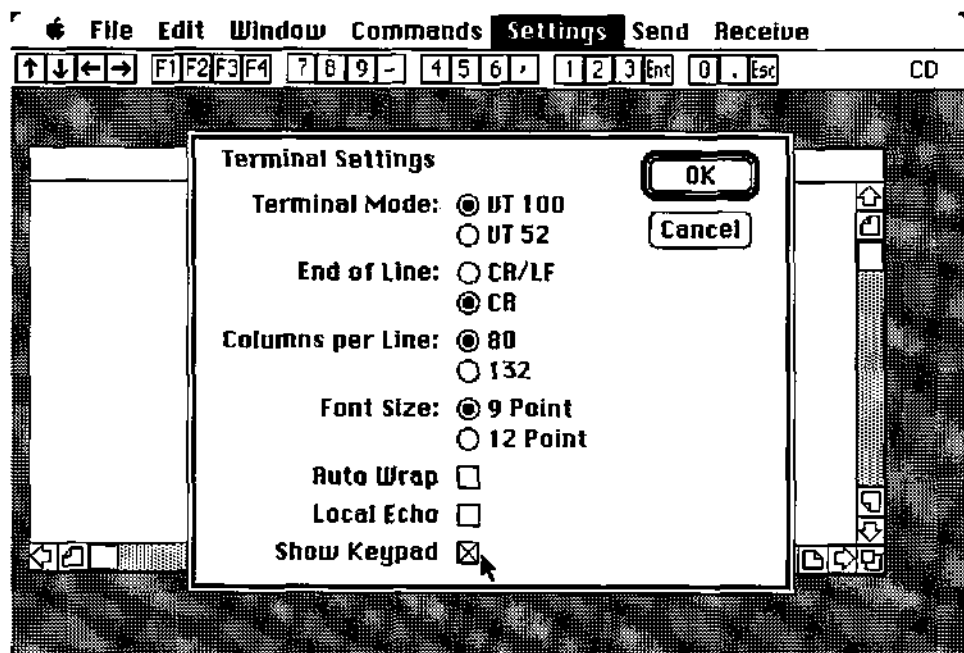


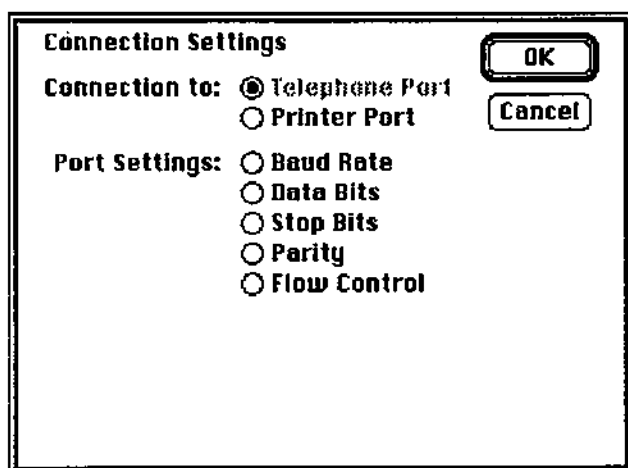
Figure 7.5: The Show Keypad option displays the VT-100 keypad on the console line.

the keypad duplicates most of these keys. You may still want to use the buttons on the console line, however, as shortcuts for the arrow keys and the Escape key.

**The Connection Settings** The second item on the Settings menu is Connection, which brings up another dialog box of options. This box, shown in Figure 7.6, lets you choose the port you want Jazz to use and the settings for the transmission system, which are governed by the system used by the computer with which you are communicating.

The first option, Connection To, lets you choose which port you want to link this Communications window to. The default is the telephone port, which is slightly better for modem transmissions. If you want to use the printer port, click the other option.

Only one Communications window can correspond to each port. The Telephone Port option is initially dimmed to show that it has already been taken. If you choose the Printer Port option, the black



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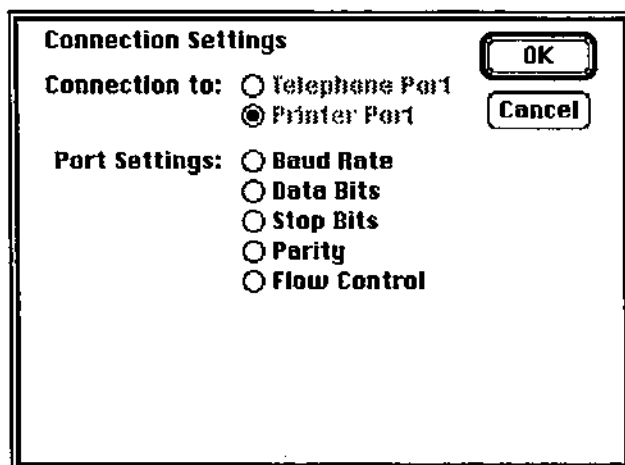
**Figure 7.6:** *The Connection Settings dialog box.*

dot will shift to that item. You cannot switch back to Telephone Port without closing the dialog box. Click OK to close the dialog box, then choose Connection Settings again. The dialog box will reopen with Printer Port dimmed to show it is selected; you can then click Telephone Port.

This odd system of dimming the active item makes more sense if you open a second Communications window and check its Connection Settings box. With two Communications windows open, both options will be dimmed to show that they are both taken, as in Figure 7.7. The second Communications window will default to the printer port. You cannot change either window's connection without closing the other window.

The five Port Settings options deal with the mechanics of how information is sent through the cables and telephone wires. You don't really need to know the details of the data transmission system, except to make sure you're using the same system as the computer on the other end of the line. However, the terminology becomes less obscure if you learn a few basic ideas.

Data transmission can occur at a variety of speeds. Computer engineers have come up with a special unit of baud to measure this speed. The number of baud divided by ten will be approximately



**Figure 7.7:** The Connection Settings box for a second Communications window will show both ports taken.

equal to the number of characters sent per second. The higher the baud rate, the faster the transmission.

Characters are stored inside the computer as groups of eight bits of information. With the various combinations of turning the eight bits on and off, the computer can represent 256 different characters.

Data transmission normally works with groups of eight bits at a time. The telephone line, however, can only transmit one bit of at a time, so the computer sends the eight bits serially, one after the other. Before and after each set of eight data bits, the computer sends one start bit and one or two stop bits. The receiving computer can then weed out the start and stop bits and rearrange the series of data bits into an eight-bit character.

The Macintosh represents characters using the ASCII code, which is standard for all microcomputers. In the ASCII code, all of the following characters are represented by numbers from 0 through 127:

- The letters of the alphabet (both capitals and lowercase)
- The digits from 0 to 9
- Standard punctuation marks
- A series of control codes, which are not printed but control certain aspects of data transmission

The numbers from 128 to 255 vary from computer to computer. On the Macintosh, they are used for foreign-language symbols and graphics characters.

Since all the standard characters can be represented by the first 128 codes, only seven of the eight data bits are really necessary for data transmission.

Some transmission systems, therefore, use only seven data bits and keep the eighth bit as a parity bit, which tells whether an odd or even number of data bits were set in the character. With even parity, the transmitting computer sets or clears the eighth bit so that there are an even number of bits set in the character. With odd parity, it sets the eighth bit so that there are an odd number of bits set.

At the receiving end, the other computer can do a kind of error check on each character that comes in. It simply adds up the number of set bits to make sure they add up to the proper number, even or odd. If the parity doesn't check, the receiving computer knows that a error has occurred in the transmission.

Even parity is the standard for seven-bit transmission. However, since most computers have no facility for correcting errors even if they detect them, the parity bit is usually ignored.

Another word you may encounter is duplex, which describes how the transmitted and received signals share the telephone cable. With no duplex, signals can only flow in one direction, never back. With half duplex, transmission can take place in both directions, but not at the same time. Full duplex, the standard, allows transmission simultaneously in both directions. Full duplex is obligatory in Jazz—there is no setting for changing it.

The final item that affects the data transmission is flow control, also called handshaking. If one computer were allowed to transmit data as fast as it wished, it could easily outrun the other computer's ability to receive. To avoid this, most communications systems let the receiving computer stop and start the transmission by sending control codes back over the wire. These codes are called XON (for *Transmit ON*, normally Control-Q or ASCII 17) and XOFF (for *Transmit OFF*, normally Control-S or ASCII 19). By alternately sending these characters, the receiving computer can keep the transmitter under control.

In choosing your responses for the five Port Settings options, you should always remember the standard rule: both computers must be set for the same system. If you are communicating with a network that uses 1200 baud, 7 data bits, 1 stop bit, even parity, and XON/XOFF flow control, you should set your system the same way.



(These numbers happen to be the defaults for a new Communications window, and they're the right ones for communicating with Telenet and other communication services.)

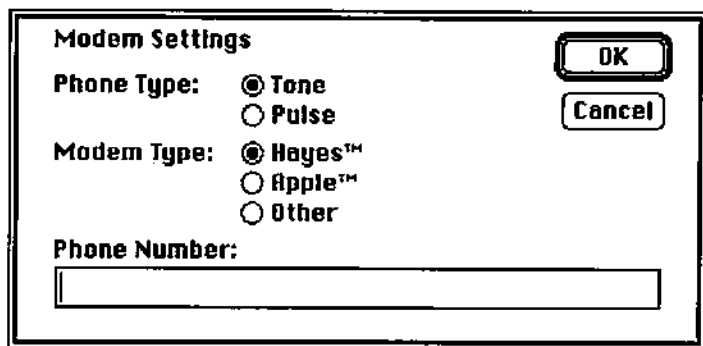
You have the following choices for the five settings:

- **Baud Rate.** Eleven different speeds are available, from 300 baud to 57,600 baud. For telephone transmissions, you'll generally want 1200 baud if you have a modem that will go that fast, 300 baud otherwise. For hardwired transmissions between computers, you can often use faster speeds, such as 9600 baud.
- **Data Bits.** Seven bits are enough if you don't use any special characters. Many corporate computers use eight bits, however, to take advantage of the extended character set. Use whatever the other computer is looking for.
- **Stop Bits.** One is the standard, since an extra stop bit merely reduces the effective transmission speed without conveying any more information.
- **Parity.** If you are using seven data bits, you should choose either odd or even parity (probably even). If you are using eight data bits, there is no parity bit, so you should choose no parity.
- **Flow Control.** The defaults are probably what you want. They are handshaking for both input and output, Control-Q (17) to start, Control-S (19) to stop.

**Modem Settings** The third item on the Settings menu is Modem, which brings up the dialog box shown in Figure 7.8. This group of settings deals with the type of modem that you are using and how you want it to dial numbers.

The Phone Type option is easy. Choose Tone if you have a touch-tone telephone, Pulse if you have a traditional rotary telephone. Pushbuttons are not necessarily a sign of a touch-tone telephone. Some cheaper telephones have pushbuttons, but they dial by sending clicks rather than tones. If you have true touch-tone service, you'll know because you're paying extra for it on your telephone bill.

The next item is Modem Type, which gives three choices for the type of modem that you're using with your system. Jazz suggests Hayes as its default choice, since the Hayes Smartmodem is the most popular and most flexible modem it supports. As its second



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**Figure 7.8:** *The Modem Settings box.*

choice, the dialog box offers Apple—the Apple 1200 or Apple 300 modem. If you have either of these modems, choose it. That way, Jazz can automatically dial numbers, answer incoming calls, and hang up the line using the modem's special commands.

If you have any other type of modem, choose Other. With any other modem, you will have to give your own commands rather than use Jazz's automatic commands.

This does not necessarily mean that you'll have to dial the number yourself. Many modems look for a code of letters that you can simply include as a part of the telephone number. When you choose the Dial command with an "Other" modem, Jazz sends the entire string of characters listed in the Phone Number box. If your modem can recognize this as a dialing code, it will be able to dial automatically. You may, however, have to answer and hang up the telephone manually.

Type the telephone number in the Phone Number box just as you would dial it. You can include a hyphen between the digits of the number, but it isn't necessary. If you want the modem to pause while dialing, insert a comma, which stands for a one-second delay. This is useful on business telephones, for example, where you need to dial 9 and wait a second to get an outside line. Just type 9, a comma, and then the number.

Some modems do not have an autodial feature. With these modems, you will typically need to dial the number first with your telephone, then press a switch to connect the computer to the line. For these modems, you don't need to type a telephone number.

The other odd case is when you're communicating through a hardwired line to another computer and not using a modem at all.

In that case, just ignore the Modem Settings box because you won't be using any of the modem features.

**Set Answerback** Jazz has an automatic answerback feature that lets you set a special message that you want to send frequently. This message is sent every time you choose *Send Answerback* from the *Commands* menu and when the other computer sends a Control-E (ENQ) code to ask for it.

In most cases, it's best just to ignore the answerback feature. Few communication systems call for an automatic answerback. However, if you want, you can use the answerback as a shortcut so that you don't have to type a common message like a login command.

To set the answerback, simply choose the item from the *Settings* menu, then fill in the *Message* box.

**U sing the Communications Module** Now that the preliminaries are done, you can finally do some actual work. What you do depends on your needs, but the same general procedure will apply to all communications, whether you're dialing into a corporate mainframe computer, dialing up an information network like *The Source*, or communicating with another small computer. Of course, the details will vary depending on the type of work you're doing.

**Dialing** If you have a Hayes or Apple modem or another modem with an autodial feature, dialing is easy. Just fill in the number in the *Modem Settings* box, along with any command codes your modem may require.

Don't type any command codes before the number if you're using a Hayes or an Apple modem. Jazz sends the command automatically when it dials. Type the command codes only if you want to use the autodial feature of another modem.

If you don't have a number of another computer you can call, you can test out the communications in a number of ways. One way is to call a local computer users' group. Many users' groups maintain a bulletin board service that is free to anyone who wants to dial in. These bulletin boards cover a variety of subjects, from the inane to the truly bizarre.

Another trick is to use Telenet, a nationwide network of local telephone numbers that link to the major networks such as The Source and Dow Jones News/Retrieval Service. Telenet is funded by the commercial services as a way of giving their subscribers local access to their networks rather than requiring them to dial a long-distance number.

Telenet requires a paying account number for some of its services, but since it also acts as a public access for other networks, Telenet allows anyone free access to some parts of its system.

To find out the local number of a Telenet computer, call Telenet's customer service:

800-336-0437 (in Virginia: 800-572-0408)

Don't use your modem to call this number! This connects you to a person who can give you a local number that you can call to reach the Telenet computer.

When you have a number, type it into the Modem Settings box and choose Dial. Lights should flash on the modem, and you should hear it dial. When the computer on the other end answers, the modem will make the connection and print the message

### CONNECT

in the Communications window.

If it doesn't, you'll have to do some detective work. The problem could be caused by any of the following:

- A faulty or incorrect cable connecting the modem to the computer (this is the most likely cause)
- Incorrect settings of the switches on the modem—check your modem manual
- A dead or noisy telephone line
- Incorrect settings of options in the Connection or Modem Settings box
- An incorrect telephone number or a malfunction in the other computer's transmission

Test everything until you get the connection to work.

**Logging In** Once you have established the connection, you usually need to login. This procedure varies depending on the

computer that you're talking to, but it usually follows the same general lines.

With Telenet, you login by pressing Return twice (other systems usually require that you type a login command). Telenet will respond:

```
TELENET
```

```
-----  
TERMINAL= _
```

The hyphens on the second line will be replaced on your screen with your area code and another code. Type

```
D1
```

after the word `TERMINAL`, then press Return. This identifies your terminal as a standard teletype, which is what it will be acting like.

Telenet responds by welcoming you with its prompt symbol, an @ sign. Complete the line as follows:

```
@mail
```

Telenet responds by printing "User name?" Now type the word `phones`

This command will connect you to a mailbox, called `phones`, within Telenet. This mailbox contains a complete listing of all the telephones in the Telenet system. Telenet makes this mailbox public (freely accessible) to encourage you to use its system.

Although the `phones` mailbox is free, it is protected by a password. Telenet asks:

```
Password? _
```

The password is `phones`, so just type that word again.

As you type, notice that the password does not appear on the screen. The Telenet computer turns off its echo while you type the password, a traditional security precaution to reduce the chances of an unauthorized person learning the word by looking at the terminal over your shoulder.

Once you've typed the password, you're in, and Telenet will begin asking you questions about which area you want telephone numbers for. Do whatever you want. This service is free, and you can't harm anything by what you type. Figure 7.9 shows a sample session using Telenet's `phones` mailbox.

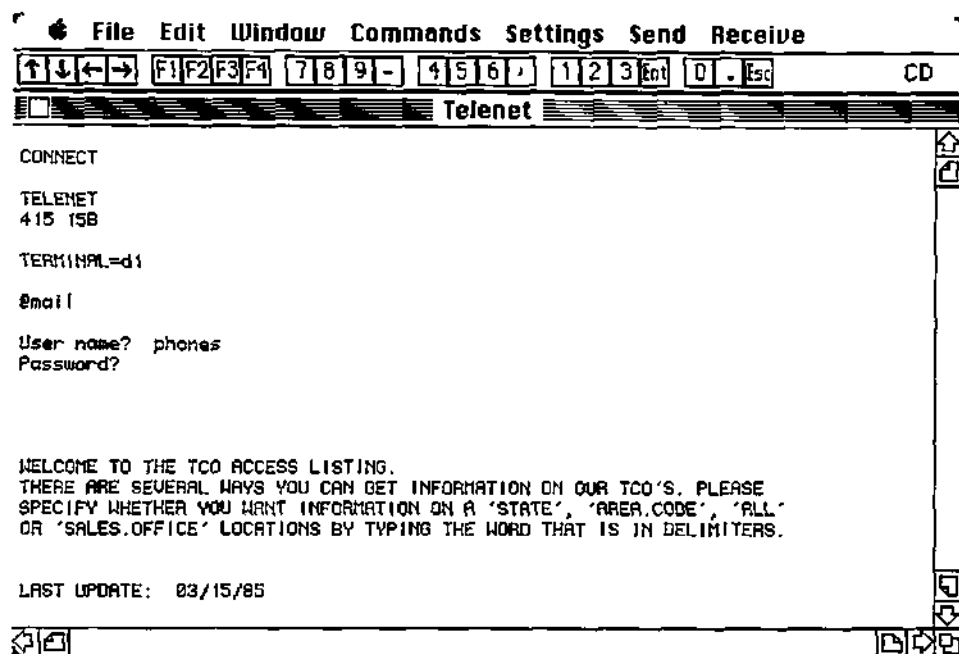


Figure 7.9: A communications session using Telenet.

**Ending the Conversation** When you're done, choose Hang Up from the Commands menu. Your modem will automatically break the connection and hang up the telephone line.

Some modems, including the Hayes, will not hang up the telephone while the other computer is still on the line. If the modem doesn't hang up, you may need to disconnect from Telenet by choosing Send Short Break from the Commands menu. Then you can hang up. Alternatively, you can simply turn off the modem's power.

On most corporate computers and communications networks, you should send a logout command before hanging up the telephone. This command tells the other computer that you're finished and that you want it to hang up.

The logout command is more than a courtesy to the other computer. If you just hang up, some communications computers are not smart enough to realize that you've ended the conversation, and they will keep a dead telephone line open. Also, since most networks charge you for the time between login and logout, you may find yourself paying for time that you don't use if you don't logout.

Most computers will automatically log you out if you don't do anything for a few minutes. This is an important safety precaution, since you will occasionally find the connection broken without any way to get back on the line and logout. Such a system assures you that you will not get permanently logged onto the other computer by accident.

**E***editing in the Communications Window* Most telecommunications systems allow you to do at least some editing of the text you type. At the very least, most systems let you use the Backspace key to erase the last character you typed so that you can correct typing errors.

Communications systems fall into two main types: those that allow only teletype editing commands and those that can use the sophisticated editing features of terminals like the VT-100. Many systems mix the two, using teletype editing for the main part of the system and a VT-100 terminal for special programs like a word processor.

You may run across an occasional system that does not allow any editing. Telenet is like this in its initial login state. If you type a backspace to correct an error in the line

#### **@mail phones**

Telenet will think you are actually trying to insert a backspace character into the line. The only thing you can do is press Return to send an invalid command, then type the line over again.

Fortunately, few systems are that unforgiving. And, if they are, it is usually only in their initial login state. Once you have started the program that you are actually going to use, these systems usually change to recognize at least the Backspace key, if not the full VT-100 editing commands.

**Teletype Systems** Many computers pretend that all terminals are mechanical teletypes. This is especially true of the computers that work commercial networks like The Source.

The traditional teletype is a mechanical beast that types one letter at a time and sends the letter as it types it. A teletype always types its letters from left to right, and it can never scroll the paper backwards.

On the screen, a teletype-style editor will work only on the line that you're typing. The only way you can move the cursor on a teletype screen is by using the Backspace key to back up and "rub out" a character. Even then, the teletype cannot erase the deleted character from the screen; it simply moves the cursor back to show that the character has been deleted. If you type new characters, they will replace the deleted characters, and the screen will become accurate again.

With Jazz, you usually can't use just the Backspace key to give this back-up command. Instead, you need to press Shift-Backspace or Shift-Command-Backspace. The reason involves the terminal emulation system described below.

**VT-100 Emulation** Some computers, especially corporate mainframes, have programs that use the more sophisticated VT-100 terminal. You can recognize a VT-100 program if you see it using any of the following features:

- Full-screen text editing and cursor movement
- Intelligent screen updates, where the other computer changes a piece of information that is not on the last line of text
- Text printed in boldface (Jazz uses boldface to represent text that would be highlighted by brighter characters on a video terminal)

Often, programs that use terminals ask you what kind of terminal you are using before they start. A good piece of mainframe software will often support a whole list of different terminals.

The VT-100 terminal has a keyboard that is quite similar to the Macintosh's. Jazz therefore makes each key on the Macintosh correspond to a key on the VT-100 terminal. In practice, however, you will use the keyboard quite differently on the terminal emulator than you would in the other parts of Jazz.

Regular letters, numbers, and punctuation marks are no problem. Jazz simply sends the letters out over the wire exactly as you type them. The Shift and Caps Lock keys have their usual effect. Letters are sent lowercase unless you explicitly shift them to uppercase.

The difference comes when you get to control codes. The VT-100, like most other terminals, sends commands to the computer on the



other end of the line. These commands are sent as special characters called control codes, and they are normally typed by pressing a Control key along with a letter of the alphabet.

On the Macintosh, the Command key is the equivalent of the Control key. In Jazz, however, the Command key can be used in combination with a letter key as a shortcut for menu bar commands. Command-Z, for example, stands for Undo throughout the program. On a VT-100, however, you may need to send a Control-Z character to the other computer.

Jazz solves the problem by using Shift-Command everywhere a VT-100 would use its Control key. To send a Control-Z character, you would press Shift-Command-Z.

Figure 7.10 shows the Macintosh keyboard and the equivalent VT-100 control codes that Jazz sends when you press Shift-Command along with the letter key. In telecommunications, these keys are often given bizarre code names, such as SOH and ENQ. These code names are shown in Figure 7.10, but you don't need to remember them. In most cases, you'll know simply that the program on the other end is expecting a Control-A, so you'll press Shift-Command-A.

If you have an optional numeric keypad, you can get much closer to the true VT-100 keyboard. The VT-100 also has a numeric keypad, which contains four function keys and directional arrow keys, as well as the ten digits.

As shown in Figure 7.11, Jazz lays out the Macintosh's numeric keypad as a VT-100 keypad. If you don't press the Shift key, you can send any of the numbers on the keypad. You can also send the four VT-100 function keys, using the four keys at the top of the keypad.

|           |         |           |     |     |     |    |     |    |    |     |       |        |        |
|-----------|---------|-----------|-----|-----|-----|----|-----|----|----|-----|-------|--------|--------|
| RS        | 1       | 2         | 3   | 4   | 5   | 6  | 7   | 8  | 9  | 0   | -     | =      | BS     |
| HT        | XOM     | ETB       | ENQ | DC2 | DC4 | EM | NAK | HT | SI | DLE | ESC   | GS     | FS     |
| Tab       | Q       | W         | E   | R   | T   | Y  | U   | I  | O  | P   | [     | ]      | \      |
| Caps Lock | SOH     | XOFF      | EOT | ACK | BEL | BS | LF  | VT | FF |     |       |        | CR     |
|           | A       | S         | D   | F   | G   | H  | J   | K  | L  | ;   | '     |        | Return |
| Shift     | SUB     | CAN       | ETX | SYN | STX | SO | CR  |    |    |     | US    |        | Shift  |
|           | Z       | X         | C   | V   | B   | N  | M   | .  | .  | /   |       |        |        |
| Option    | Command | MUL Space |     |     |     |    |     |    |    |     | Enter | Option |        |

Figure 7.10: Jazz uses Shift-Command keys to simulate VT-100 control keys.

|              |       |     |     |       |
|--------------|-------|-----|-----|-------|
| Shift + Key: | Break |     | ←   | →     |
| Key alone:   | PF1   | PF2 | PF3 | PF4   |
|              | 7     | 8   | 9   | ↑     |
|              | 4     | 5   | 6   | ↓     |
|              | 1     | 2   | 3   | Enter |
|              | 0     |     |     |       |

**Figure 7.11:** The layout of the simulated VT-100 keypad.

To simulate the VT-100 arrow keys, press Shift with the indicated key (not Shift-Command).

If you don't have a numeric keypad, you should use the Show Keypad command in the Terminal Settings box. Jazz will place a series of buttons on the console line to represent the keys on the keypad. In a VT-100 program that requires the PF4 function key, you could send the proper code by clicking the box on the console line.

Even if you have a numeric keypad, you may still want to use the console-line display. One advantage is that the console-line buttons let you use the arrow keys without pressing Shift and a key on the numeric keypad—you can just click the arrow button on the console line. In most VT-100 programs, these buttons will move the cursor on the screen.

The console line's keypad includes another important key that is otherwise missing from the Macintosh keyboard: the Escape key. This key is vital for most communications work because many VT-100 programs also look for escape-sequence commands. The escape sequence Escape-A, for example, would be typed by pressing the Escape key and then typing the letter A. Using just the keyboard, you can send the Escape character by pressing Shift-Command and the bracket ([]) key, but you will probably find it easier to click the Escape button on the console line.

And, unfortunately, you may still need to use Shift-Command-Backspace instead of just Backspace, even with a VT-100 emulator. Some VT-100 programs will, however, understand the unshifted Backspace as a deleting backspace. Test your program to find out. If Backspace appears to do nothing, you'll have to use Shift-Command-Backspace.

**File Transfers** You can use your Macintosh to send and receive whole files of information. This can be very useful when you need to exchange large quantities of information with a distant computer or when you need to transfer your Macintosh files to an incompatible computer, such as an IBM PC.

File transfers can take place either through a modem or through a hardwired connection between two computers. If you are exchanging a worksheet with a branch office in another city, you will establish a telephone connection through a modem. If you are transferring a Lotus 1-2-3 file from an IBM PC in the same office, you can string a cable between the two computers.

Throughout the rest of this chapter, we'll assume that you're transferring files between two computers sitting in the same room. The mechanics of using Jazz are the same whether you're transferring files through a three-foot cable or across a 3000-mile telephone line. However, it's easier to think of giving commands to two different computers when they're sitting right next to each other. (If you are sending files by telephone, you may want to call the person running the other computer, using a second telephone line as a voice link.)

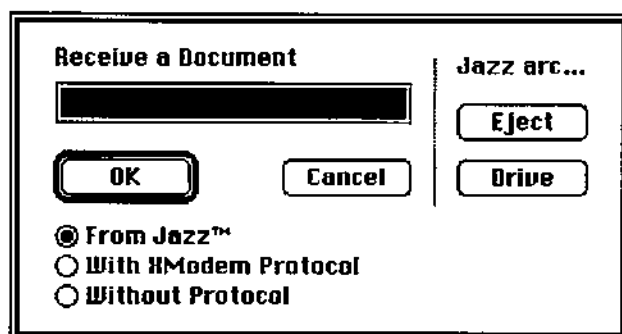
There are three basic ways that you can use Jazz's communication module to work with files:

- You can capture incoming data as a disk file.
- You can receive a complete file directly from another computer.
- You can send a complete file to another computer.

You can use the commands on the Send and Receive menus to perform these three types of transfers.

**Capturing Data** The simplest of these types of transfers is capturing data. To capture data, you simply open a disk file that records every letter that comes in over the line. You could use this feature to make a disk record of an exchange with a friend or a session on The Source. You could also use it as a simple means of accepting a file that you ask the other computer to send.

To set Jazz to capture incoming data, choose the Set File command on the Receive menu. When you do this, Jazz displays a dialog box like the one shown in Figure 7.12.



---

**Figure 7.12:** The *Receive a Document* dialog box for setting a file.

The first thing you should enter in this dialog box is the name of the file into which you want to receive the data. Make sure that you type the name of a new file. If you type the name of an existing file, the new data will replace whatever was previously stored in that file.

You must also choose a protocol before you close the dialog box. To capture data, you want to choose the third option, *Without Protocol*.

The dialog box displayed by *Set File* merely sets the file name and protocol. It doesn't actually start the recording. To do that, you choose *Start*, the last item on the *Receive* menu. An indicator, *Rcv On*, appears on the console line, and the recording begins. As you work, you will occasionally hear the disk spin as it records data.

When you're done receiving the data that you want to capture, choose *Stop* from the *Receive* menu. The disk will whirl again as it closes the file. The information is then safely recorded on disk.

Jazz captures data as a plain text file, with no formatting information. You can open this file with the Jazz word processor.

After setting the file name or protocol, you cannot change those settings without starting and ending a recording. Once you have clicked *OK* in the dialog box, you cannot use the *Set File* command on the *Receive* menu until you start and finish the recording. This can be annoying if you forgot to choose *Without Protocol* in the box. If this happens, you need to start and stop a protocol file transfer before you can make another selection from the dialog box. See the discussion below for information about cancelling a protocol transfer.

The great advantage of capturing data is that it works no matter what the computer at the other end is doing. The other computer

doesn't have to be set up to send a file. If you want, you can capture a routine logon procedure that isn't part of a file at all. Even if the other computer has no facility for file transfers, you can often get it to send information just by having it type data on the screen.

If you are transferring a text file from another computer, you should set the other computer to send the file without protocol. Set Jazz to capture data as a file and choose **Start** on the **Receive** menu. Then give the **Send** command on the other computer. The text file will be sent across the wire, and Jazz will type it in the **Communications** window. At the same time, Jazz will record the incoming file as a text file on disk. When you're done, the captured file will contain the same text as the file on the other computer, without the formatting information.

**Receiving Data into a Document** It is also possible to receive data into another Jazz document, rather than into a new file. You can receive text data into any **Database**, **Worksheet**, or **Word Processor** window. The incoming data will be displayed in the **Communications** window as well as inserted into the the Jazz document.

The procedure for this kind of transfer is similar to the procedure for capturing incoming data, but it is more complicated because it involves two different Jazz windows. Follow these steps to receive data into a document:

1. Open the database, worksheet, or word processor file in which you want to insert the data.
2. Mark where you want to insert the incoming data. In a database, mark a cell or record. In a worksheet, mark a cell or a range. In a word processor document, place the insertion point where you want to add the text or mark the block that you want to replace. Figure 7.13 shows how the marked items are inserted.
3. Switch to the **Communications** window.
4. Choose **Set Selection** from the **Receive** menu.
5. Choose **Start** from the **Receive** menu.
6. Start the transmission from the other computer. The incoming data will appear inside the **Communications** window and will be inserted at the place that you have marked in the Jazz document.

7. When the transmission is finished, click Stop on the Receive menu. You can then switch to the other Jazz window and treat the received data as Jazz data.

Transfers of this type are always performed without a protocol.

If you are receiving data into a worksheet or database, you may want to use the Parse Settings command. As in the other parts of Jazz, the Parse Settings command on the Receive menu calls up a box that lets you name the characters that separate each column and line in the table.

If you are receiving a worksheet file from Jazz or a spreadsheet from Symphony, Multiplan, or any other program, you can probably leave the parse settings as they are. Most spreadsheets separate columns with a tab character and end each line with a carriage return, exactly as the parse settings are set.

The options in the Parse Settings box can be useful when you are gathering data from information services. For example, on a network such as the Dow Jones Retrieval/News Service, you can

| <i>Document</i> | <i>Item Marked</i> | <i>How Text Is Inserted</i>   |
|-----------------|--------------------|---|
| Database        | Cell               | Replaces cell, stops when full.   |
|                 | Field              | Replaces each cell in that column of each record.   |
|                 | Record             | Inserts new records after the last record selected, fills the new records with data.                                  |
| Worksheet       | Cell               | Begins receiving data in that cell, continues to replace as many cells as necessary to accommodate the incoming data. |
|                 | Range              | Replaces the range with the incoming data, then stops.  |
| Word Processor  | Insertion Point    | Inserts incoming data at that point.  |
|                 | Block              | Replaces the block with the incoming data.  |

---

**Figure 7.13:** *How to mark other Jazz documents to receive data through the Communications window.*

accomplish a neat trick by adjusting the Parse Settings. The Dow Jones network lists its stock quotations in a set format, with columns of a fixed width. By choosing the Column Widths option in the Parse Settings box you can set as many as eight fixed-width columns. You could then receive stock quotations directly into the columns of a worksheet or database. Later, you could perform search queries or graph trends based on this information.

If you're planning to do this sort of thing, however, it's a good idea to first capture the data as a text file on disk rather than to try to fit the data directly into a worksheet. Later, you can transfer the text file into a worksheet using the Parse Settings command. You'll almost always need to adjust the parse settings to translate the columns correctly. It's generally easier and cheaper to make the adjustments later on a disk file, rather than while you're paying for time on a network.

**Protocol Transfers** When you're transferring whole files, you should use a protocol transfer. In such a transfer, the two computers talk to each other to coordinate the transmission. This coordination ensures that the entire file is transferred and that the transmission is checked for errors. Protocol transfers are also called supervised file transfers and formal file transfers because of the fixed procedure that they follow.

Jazz offers two protocols:

- **To/From Jazz:** If you're transferring an entire Jazz document to another Macintosh running Jazz, you should choose this protocol, which transfers all graphics and formatting information. The receiving computer's version of the file will be identical to the sending computer's. This is the only protocol that you can use to transfer graphics, form, and communications documents.
- **XModem Protocol:** This is the industry's standard for file transfers. The XModem protocol transfers information in blocks of 128 bytes, then stops to check the received version against the original. The protocol locks the two computers into step and automatically sends each block until the entire file is transferred. Almost all communications programs support the XModem protocol. This protocol will send only the text portion of the document—not the graphics or formatting information.

You must use the same protocol on both the sending and the receiving computers.

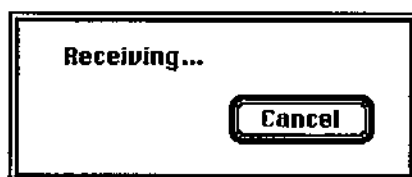
**Receiving a Protocol Transfer** To receive a file in a protocol transfer, you must be connected to another computer running a communications program. It doesn't matter what computer or what program—most communications programs support at least the XModem protocol. If you have an IBM PC running Symphony, for example, you can send a spreadsheet with Symphony's communications module.

Start by choosing Set File on the Receive menu, just as you did for capturing data. This time, however, choose either the From Jazz or With XModem Protocol button at the bottom of the Receive a Document dialog box.

Press Start on the Receive menu. You will then see the Receiving dialog box shown in Figure 7.14. You won't be able to give other commands until you complete or cancel the transfer. Even the Receive menu is inactive while this box is on the screen; you can't pull the menu down to choose Stop.

Now go to the sending computer and give it the command for sending a file with the proper protocol. The command will depend on which communications program you are using. If the other computer is a Macintosh with Jazz, use the Send commands described below.

The other computer will then start sending its file to your Macintosh. With the XModem protocol, you can watch the transfer operation in action. As the sending computer sends each block, a number in the Receiving dialog box shows how many blocks Jazz has accepted. With most communications programs, the sending program will also display the number of the block it is transmitting. The numbers on the two machines should increase by steps as each block of the file is transferred. The two numbers should remain within one or two of each other.



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**Figure 7.14:** A protocol transfer stops the program with this dialog box until the transfer is completed.



Cancelling a protocol transfer can be a delicate operation. If you click the Cancel button in the dialog box, nothing may seem to happen. This is because the protocol transfer locks the Macintosh in step with the codes that it is expecting from the other computer. If it does not get those codes, it will go on spinning its wheels, not stopping to check whether you are clicking on Cancel.

Click Cancel and wait. Be patient—it might take 10 seconds. The transfer operation will eventually recognize the Cancel command and stop waiting to receive the file. Or, if you do nothing and don't start the other computer, Jazz will decide after about a minute that the other computer is not going to send the file, and it will cancel the operation itself.

Once the other computer has successfully transferred the last block in the file, it sends a code across the line to show that the transfer is complete. Jazz recognizes this code and closes the file that it has received. The Receiving dialog box disappears, and you can go back to other operations.

***Sending Files*** Sending a file is the exact opposite of receiving, so it should come as no surprise that the procedure is an exact mirror image. This time, however, you are preparing a file to send from your Macintosh, and you're setting up the other computer to receive the data. You can send files either with or without a protocol.

With a protocol, you will be locking the two computers into a synchronized exchange, just as you did to receive a protocol transfer. Follow these steps:

1. Use the Set File command on the Send menu to choose the file that you want to send. Set File will bring up the Send a Document dialog box shown in Figure 7.15. Note that you can send non-Jazz files such as the Clipboard and even the Finder.
2. Choose the protocol that you plan to use and click OK.
3. Set up the other computer to receive a formal transfer with the same protocol. If you're sending to another Macintosh with Jazz, use Set File on the Receive menu on the other Macintosh.
4. Choose Start on the Send menu. A Sending dialog box will appear.

5. Give the appropriate receive command to the other computer. The formal transfer will begin and proceed by blocks. When the last block has been transferred, the Sending box will disappear, and you can return to other operations.

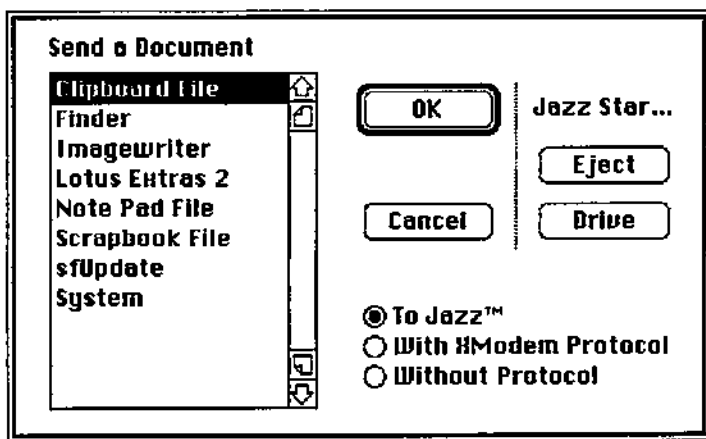
Note that you tell Jazz to begin sending the file before you tell the other computer to start receiving. You won't lose any information this way. Jazz waits to begin sending until the other computer sends a code to say that it is ready to receive.

If you're sending without a protocol, you simply set the computer at the other end to capture incoming data, then have Jazz send the text of the file over the line. The text will scroll across the other computer's screen, and the other computer will capture it in a file.

You can also send a selected portion of a Jazz document. Open the Jazz document and mark the selection. The selection can be any of the following:

- A cell, record, or series of records in a database
- A cell or range in a worksheet
- A block in a word processor document

Then switch to the Communications window and choose Set Selection from the Send menu. Set up the other computer to capture data, then choose Start. Only the selection that you have marked will be sent. Selections are always sent without a protocol.



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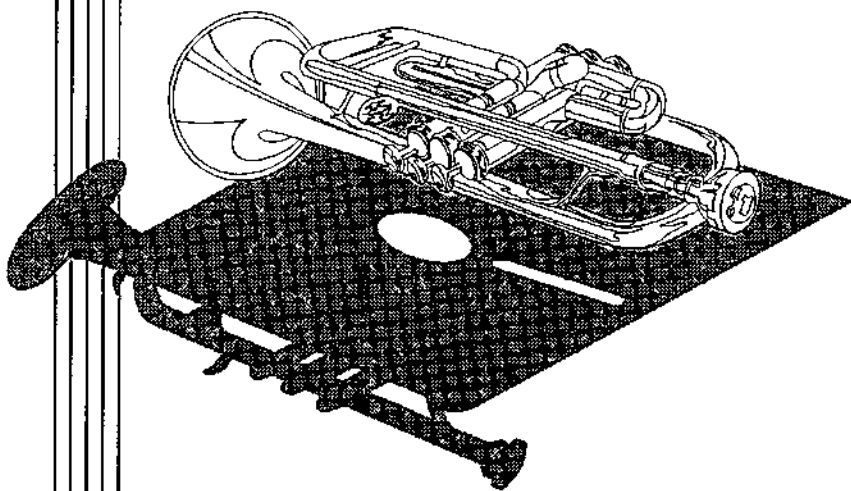
Figure 7.15: The dialog box for choosing a file to send.

**S***ummary* Jazz's communications module lets you send and receive information over long distances. By attaching your computer through a modem to a telephone line, you can work with large computers and information networks. You can also connect your computer to another computer and exchange files of information.

Before you can send or receive data, you must use the Settings menu to set Jazz for the proper type of data transmission. If you have an autodial modem, you can preset the number the modem will dial to make its connection.

Most large computers communicate as if they are talking to a simple teletype. For more sophisticated programs, Jazz can emulate a VT-100 terminal, which provides full-screen editing.

File transfers are the other major application of Jazz's communications module. You can either capture incoming data as a file, or you can use a standard protocol to run a formal file transfer. You can insert data into other Jazz documents, and you can send a selected part of a Jazz document to another computer.



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# ***EXECUTIVE REPORT***

# 8

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**I****NTRODUCTION** This chapter is a sample business report developed with Jazz and produced on a laser printer. We've described various parts of the report in detail at the beginning of other chapters in the book. Here, we bring it all together to show you what Jazz can do.

We used the Jazz worksheet to do the calculations for the report, then graphed the results. The WidgeCo staff list and regional performance summaries are drawn from a database. We incorporated material from these modules into the word processor, wrote the report, and printed it with a few enhancements from the Font and Style menus. Nothing you see in the reports—tables, charts, lists, and so on—had to be typed twice: just copied from where it was to where it's needed.

MEMORANDUM

From: J. Widge  
To: All Widgeco Salespeople  
Date: July 26, 1985  
Subject: Regional Sales Performance Report

In an effort to evaluate quotas and increase sales productivity, Widgeco traditionally reviews its salespeople's performance in the middle of each calendar year.

As a part of this analysis, we have attached the following documents:

- A chart comparing the performance of all 50 Widgeco salespeople.
- A table analyzing the sales by region.
- Graphs showing the sales volume of the salespeople in each of the five regions.

In general, these sales figures are very encouraging. While this document obviously shows that there is still room for improvement, we feel there is clear reason for optimism.

Thank you all for your contributions. See you at the meeting August 14.

WIDGECO INC.

25TH YEAR

**REGIONAL SALES PERFORMANCE REPORT**

**July, 1985**

***"25 YEARS OF WIDGETS FOR PROGRESS"***

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**25th Annual Sales Conference**

This year's Sales Conference will be held August 14th through 18th at the Tall Palms Resort on Oahu. The Annual Sales Conference is a time for all of us to take stock of past performance and set our sights on goals for the coming year. We all look forward to renewing old friendships and making new ones.

This is a special year for Widgeco Inc., our 25th Anniversary of growth and industry leadership. The secret of our success is the dedication of our people. The Sales Conference this year will give special recognition to those whose record of excellence is an inspiration to all of us.



WIDGECO INC.

Sales Performance Report

### Executive Summary

Sales performance exceeded goals company-wide as well as in each region. Thirty-one sales people reached or exceeded their sales goals; twelve exceeded goals by 25% or more.

Corporate sales were \$19,334,900, or 103% of goal. The average sales person tallied \$390,478 in sales.

Central region retained its traditional place as leading generator of revenue, at \$5,344,820, recovering from last year with new auto industry contracts.

The West region recovered from production bottlenecks in the plant in Sacramento to finish the year in second place. The East region performed well.

Europe gained from the successful introduction of the new A line and plant modernization, as well as the addition of new markets.

The Pacific region met its performance goals despite increased competition.

July 1985

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WIDGECO INC.

Sales Performance Report

## SALES STAFF PERFORMANCE

Performance by the WidgeCo sales staff in the preceding fiscal year was up over last year and on the average exceeded sales goals. Of the company's 50 sales people, 31 reached or exceeded their sales goals for the year. Twelve exceeded goals by 25% or more. This success is clearly due to policies put in place by the sales department and executive committee, especially since goals were raised over last year's targets.

By tradition, WidgeCo gives a plaque to each region's top performing salesperson. Because of the superior performance this year, the president will for the 25th Anniversary Sales Conference hand out bronzed widgets on oak bases to the top two performers in each region, and a special prize to the top two overall performers, noted below:

|          |          |         | Sales     | Performance |
|----------|----------|---------|-----------|-------------|
| Central: | Franklin | Julius  | \$333,600 | 139%        |
|          | Cook     | Patrick | \$428,120 | 118%        |
| East:    | Geraldi  | Anthony | \$369,740 | 117%        |
|          | Sanders  | Allen   | \$330,820 | 116%        |
| Europe:  | Vaughan  | William | \$330,820 | 136%        |
|          | East     | Deborah | \$250,200 | 109%        |
| Pacific: | Minh     | Lee     | \$486,500 | 121%        |
|          | Goode    | Eugene  | \$380,860 | 105%        |
| West:    | Whitman  | Mary    | \$255,760 | 134%        |
|          | Elliot   | Harry   | \$222,400 | 112%        |

## REGIONAL ANALYSIS

The following chart shows sales by region and average of sales goals for the regions and for the company as a whole.

|         | Total Sales | Average Performance |
|---------|-------------|---------------------|
| East    | \$4,067,140 | 102%                |
| West    | \$4,620,360 | 103%                |
| Central | \$5,334,820 | 104%                |
| Europe  | \$2,290,720 | 106%                |
| Pacific | \$3,021,860 | 100%                |

July 1985

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WIDGECO INC.

Sales Performance Report

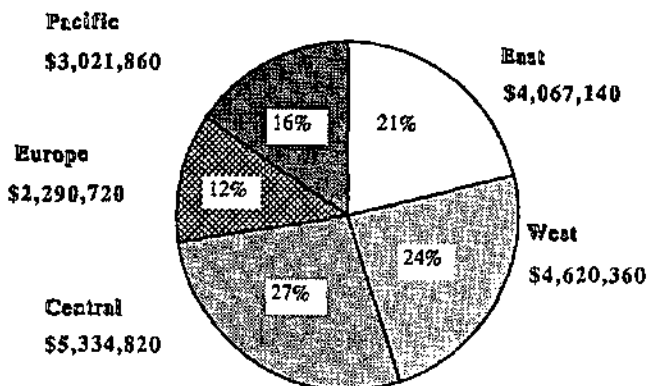
|           |              |      |
|-----------|--------------|------|
| Corporate | \$19,334,900 | 103% |
|-----------|--------------|------|

Average sales figures per salesperson by region were:

|         |           |
|---------|-----------|
| East    | \$338,928 |
| West    | \$355,412 |
| Central | \$444,568 |
| Europe  | \$381,787 |
| Pacific | \$431,694 |

|           |           |
|-----------|-----------|
| Corporate | \$390,478 |
|-----------|-----------|

The following chart shows the contribution of each region to the corporate sales total:



### Regional Sales, 1st Half 1985

This year's performance met or exceeded goals in all Sales Regions. Performance ratios ranged from 100% in the Eastern Region to 106% in Europe. These results represent both an actual increase in sales and improved ratios relative to last year.

July 1985

## WIDGECO INC.

## Sales Performance Report

Demand for WidgeCo products was influenced by several factors this year. The first quarter saw the opening of two new plants by competitors in the Far East. The effects were not fully felt until the second quarter when our Pacific region orders began to decline. The effect for the year is shown in the Performance Ratio for the Pacific region which, at 100%, is the lowest; nevertheless, the Pacific region achieved its goals for the year.

At the other end of the scale, our new A-line widgets proved quite successful in Europe. Price reductions resulting from modernization of our Irish manufacturing facilities gave us modest access to new East European markets. Our European sales staff is optimistic that we can develop these markets significantly in the future. The European region, while smallest in dollar contribution to corporate sales, exceeded its goals by a record six percent.

The Central Region recovered well from the flat results of the two preceding years and remains our strongest contributor to revenues. The automotive industry's favorable reaction to our new line of micro-widgets promises continued strong results.

Results in the Eastern and Western Regions were similar. With performance ratios of 102% and 103%, respectively, sales in both regions are holding their own in the face of increased domestic and foreign competition. Production bottlenecks in the Sacramento plant lowered Western Region sales in the third quarter, but were corrected by year end. A campaign to promote penetration of our model D line improved sales in the West of this traditionally weak performer.

New, ambitious sales goals will be set at the sales conference, where plans for bold moves on several fronts to respond to competitive threats will be unveiled. The new year is expected to build once again on a strong staff and bold leadership

WIDGECO INC.

Sales Performance Report

# APPENDIX A PERFORMANCE FIGURES

## Central Sales Region

| Last Name | First Name | Sales     | Index |
|-----------|------------|-----------|-------|
| Caffrey   | Paula      | \$366,960 | 100%  |
| Castle    | Robert     | \$550,440 | 102%  |
| Connors   | Elizabeth  | \$394,760 | 104%  |
| Cook      | Patrick    | \$428,120 | 118%  |
| Franklin  | Julius     | \$333,600 | 139%  |
| Henderson | Janet      | \$536,540 | 98%   |
| Marques   | George     | \$386,420 | 94%   |
| Martin    | Vera       | \$417,000 | 96%   |
| Monaldez  | Frank      | \$558,780 | 80%   |
| Muller    | Elizabeth  | \$450,360 | 110%  |
| Roche     | Joan       | \$397,540 | 109%  |
| Stephens  | Johnathan  | \$514,300 | 101%  |

Sales Total for Region Central      \$5,334,820

Average Index for Region Central      104%

Performance Figures

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WIDGECO INC.

25th Annual Sales Conference

East Sales Region

| Last Name | First Name | Sales     | Index |
|-----------|------------|-----------|-------|
| Akins     | James      | \$408,660 | 100%  |
| Coffey    | Eleanor    | \$430,900 | 85%   |
| Ford      | Franklin   | \$286,340 | 116%  |
| Geraldi   | Anthony    | \$369,740 | 117%  |
| Harrison  | Benjamin   | \$291,900 | 113%  |
| Jackson   | Ellen      | \$355,840 | 97%   |
| Jefferson | Carla      | \$355,840 | 94%   |
| Lynch     | Ellen      | \$375,300 | 101%  |
| Sanders   | Allen      | \$330,820 | 116%  |
| Steele    | Barbara    | \$278,000 | 108%  |
| Thomson   | Anne       | \$216,840 | 77%   |
| Tynan     | Roger      | \$366,960 | 99%   |

|                             |             |
|-----------------------------|-------------|
| Sales Total for Region East | \$4,067,140 |
|-----------------------------|-------------|

|                               |      |
|-------------------------------|------|
| Average Index for Region East | 102% |
|-------------------------------|------|

Performance Figures

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WIDGECO INC.

25th Annual Sales Conference

Europe Sales Region

| Last Name | First Name | Sales     | Index |
|-----------|------------|-----------|-------|
| Almassa   | Robert     | \$442,020 | 97%   |
| East      | Deborah    | \$250,200 | 109%  |
| Fogarty   | John       | \$272,440 | 104%  |
| Garfield  | Thomas     | \$530,980 | 106%  |
| Maggiore  | Leonard    | \$464,260 | 87%   |
| Vaughan   | William    | \$330,820 | 136%  |

|                               |             |
|-------------------------------|-------------|
| Sales Total for Region Europe | \$2,290,720 |
|-------------------------------|-------------|

|                                 |      |
|---------------------------------|------|
| Average Index for Region Europe | 106% |
|---------------------------------|------|

WIDGECO INC.

25th Annual Sales Conference

West Sales Region

| Last Name | First Name | Sales     | Index |
|-----------|------------|-----------|-------|
| Allen     | Thomas     | \$286,340 | 111%  |
| Alpers    | Nancy      | \$372,520 | 104%  |
| Callahan  | MaryEllen  | \$464,260 | 100%  |
| Dixon     | Ronald     | \$544,880 | 93%   |
| Elliot    | Harry      | \$222,400 | 112%  |
| Ellis     | Paul       | \$214,060 | 99%   |
| Freud     | Lawrence   | \$428,120 | 103%  |
| Glenn     | Edward     | \$344,720 | 107%  |
| Griffon   | Harold     | \$291,900 | 89%   |

|                             |             |
|-----------------------------|-------------|
| Sales Total for Region West | \$4,620,360 |
|-----------------------------|-------------|

|                               |      |
|-------------------------------|------|
| Average Index for Region West | 103% |
|-------------------------------|------|



**APPENDIX B  
WIDGECO SALES STAFF**

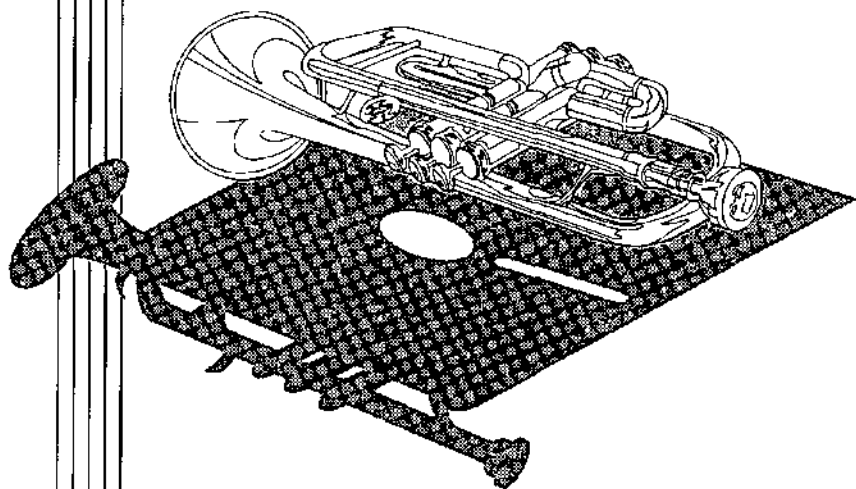
|    | <b>Last Name</b> | <b>First Name</b> | <b>SSN</b>  | <b>Region</b> | <b>Sales</b> |
|----|------------------|-------------------|-------------|---------------|--------------|
| 1  | Adams            | Samuel            | 689-75-1730 | Pacific       | \$173,000    |
| 2  | Akins            | James             | 582-81-2780 | East          | \$147,000    |
| 3  | Allen            | Thomas            | 293-31-0209 | West          | \$103,000    |
| 4  | Almassa          | Robert            | 577-10-9647 | Europe        | \$159,000    |
| 5  | Alpers           | Nancy             | 452-67-3050 | West          | \$134,000    |
| 6  | Caffrey          | Paula             | 594-01-9252 | Central       | \$119,000    |
| 7  | Callahan         | MaryEllen         | 925-66-3813 | West          | \$132,000    |
| 8  | Castle           | Robert            | 927-01-5595 | Central       | \$167,000    |
| 9  | Coffey           | Eleanor           | 770-46-5329 | East          | \$198,000    |
| 10 | Connors          | Elizabeth         | 793-64-2819 | Central       | \$155,000    |
| 11 | Cook             | Patrick           | 787-23-0845 | Central       | \$142,000    |
| 12 | Dixon            | Ronald            | 814-52-2641 | West          | \$154,000    |
| 13 | East             | Deborah           | 638-92-1038 | Europe        | \$196,000    |
| 14 | Elliot           | Harry             | 371-14-1693 | West          | \$90,000     |
| 15 | Ellis            | Paul              | 139-43-5420 | West          | \$80,000     |
| 16 | Fogarty          | John              | 610-15-2073 | Europe        | \$77,000     |
| 17 | Ford             | Franklin          | 563-84-2709 | East          | \$98,000     |
| 18 | Franklin         | Julius            | 220-75-8345 | Central       | \$103,000    |
| 19 | Freud            | Lawrence          | 512-81-9277 | West          | \$120,000    |
| 20 | Garfield         | Thomas            | 689-15-7806 | Europe        | \$154,000    |
| 21 | Geraldi          | Anthony           | 443-52-8902 | East          | \$191,000    |
| 22 | Glenn            | Edward            | 871-55-1872 | West          | \$133,000    |
| 23 | Goode            | Eugene            | 551-68-7436 | Pacific       | \$124,000    |
| 24 | Griffon          | Harold            | 752-86-1593 | West          | \$137,000    |
| 25 | Harrison         | Benjamin          | 431-69-4035 | East          | \$105,000    |
| 26 | Henderson        | Janet             | 391-45-0257 | Central       | \$105,000    |
| 27 | Jackson          | Ellen             | 262-60-7734 | East          | \$193,000    |
| 28 | Jefferson        | Carla             | 663-92-4091 | East          | \$128,000    |
| 29 | Keller           | Jennifer          | 428-51-3760 | Pacific       | \$128,000    |
| 30 | Lin              | Katherine         | 935-38-6303 | Pacific       | \$176,000    |
| 31 | Lynch            | Ellen             | 364-91-2240 | East          | \$98,000     |
| 32 | Maggiore         | Leonard           | 542-75-5193 | Europe        | \$135,000    |
| 33 | Marques          | George            | 343-26-4819 | Central       | \$167,000    |
| 34 | Martin           | Vera              | 255-31-6051 | Central       | \$139,000    |
| 35 | Minh             | Lee               | 457-49-0844 | Pacific       | \$150,000    |
| 36 | Mitchell         | Carl              | 861-57-1535 | West          | \$175,000    |
| 37 | Monaldez         | Frank             | 167-30-0865 | Central       | \$113,000    |
| 38 | Moore            | Dorothy           | 529-41-1173 | West          | \$201,000    |

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|    |          |           |             |         |           |
|----|----------|-----------|-------------|---------|-----------|
|    | Muller   | Elizabeth | 943-19-5678 | Central | \$152,000 |
| 39 | Robbins  | Richard   | 311-47-4721 | Pacific | \$162,000 |
| 40 | Roche    | Joan      | 735-32-2788 | Central | \$167,000 |
| 41 | Sakai    | James     | 231-54-1503 | Pacific | \$143,000 |
| 42 | Sanders  | Allen     | 168-62-5798 | East    | \$161,000 |
| 43 | Santos   | Paul      | 551-67-0482 | West    | \$119,000 |
| 44 | Steele   | Barbara   | 471-84-5312 | East    | \$165,000 |
| 45 | Stephens | Johnathan | 626-90-1944 | Central | \$100,000 |
| 46 | Thomson  | Anne      | 498-55-1780 | East    | \$185,000 |
| 47 | Tynan    | Roger     | 365-78-2141 | East    | \$78,000  |
| 48 | Vaughan  | William   | 281-45-1198 | Europe  | \$132,000 |
| 49 | Whitman  | Mary      | 541-43-4897 | West    | \$92,00   |





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# ***JAZZ AT A GLANCE***

# A

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**INTRODUCTION** This appendix lists Jazz menu commands alphabetically for easy reference. Many commands are available in all Jazz modules; others are used only in individual applications. For details about Jazz commands and examples of how they work, see the appropriate chapters of this book.

Command: **About Jazz**                      Menu: Apple

Use: Shows the amount of memory (RAM) available and the amount in use.

Command: **Add Field**                      Menu: Edit

Use: Database command. Adds a blank field after the last field in the database. The maximum number of fields in a database is 100, depending on the amount of memory in use.

Command: **Add Record**                      Menu: Edit

Use: Database command. Adds a blank record at the end of the database.

Command: **Align Fields**                      Menu: Style

Use: Database Form command. Aligns the entry and message boxes on a database form.

Command: **Answer**                      Menu: Commands

Use: Communications command. Answers a phone call if your modem doesn't do so automatically.

Command: **Associate**                      Menu: Plot

Use: Graphics command. When plots on a graph have different ranges, use Associate to relate each plot to the correct range on the horizontal and vertical axes.

Command: **Cancel Titles**                      Menu: Range

Use: Worksheet command. Releases the rows or columns (if any) that you've set as titles.

Command: **Clear**                      Menu: Edit

Use: Erases contents of the selected area from the active document. Unlike Cut, the Clear command does not place the contents onto the Clipboard.

Command: **Clear Page Break**                      Menu: Range

Use: Worksheet command. Removes selected page break from the worksheet.

Command: **Clipboard**                      Menu: Window

Use: Opens the Clipboard or makes it active if it is already open.

Command: **Close**

Menu: File

Use: Closes the active window.

Command: **Column Widths**

Menu: Style

Use: Worksheet command. Sets the width of worksheet columns.

Command: **Compute Table**

Menu: Tools

Use: Worksheet command. Calculates the values specified with the Set Table Ranges command.

Command: **Connection**

Menu: Settings

Use: Communications command. Defines the transmission settings for communication with another computer.

Command: **Convert**

Menu: Apple

Use: Converts files from Lotus 1-2-3, Lotus Symphony, and Microsoft SYLK format to Jazz worksheets.

Command: **Copy**

Menu: Edit

Use: Copies the selected area from the active document to the Clipboard. The original remains intact in the active document.

Command: **Cut**

Menu: Edit

Use: Removes selected area from active document and places it on Clipboard.

Command: **Date**

Menu: HotView

Use: Word processing command. Inserts the current date as a Hot-View at the cursor position in a document.

Command: **Define Criteria**

Menu: Query

Use: Database Form command. Used to specify the criteria for database searches.

Command: **Desk Accessories**

Menu: Apple

Use: Lists standard Macintosh desk accessories (Scrapbook, Note Pad, Control Panel, etc.).

Command: **Dial**

Menu: Commands

Use: Communications command. Calls the phone number specified for auto-dialing.

Command: **Disable Undo**                      Menu: Apple

Use: Turns off the Undo command. With Undo disabled, Jazz uses less memory and runs faster, but you can't reverse previous commands such as Cut, Paste, and Clear.

Command: **Drop Duplicates**                      Menu: Query

Use: Database command. Drops duplicate records from those selected with a database query.

Command: **Duplicate**                              Menu: Edit

Use: Graphics command. Copies the selected notation box, arrow, or line.

Command: **Enable Undo**                      Menu: Apple

Use: Turns on the Undo command. With Undo Enabled, you can reverse the immediately preceding command (Cut, Paste, etc.) and restore the active document as it had been.

Command: **Enter into Formula**                      Menu: Edit

Use: Available in worksheets. Displays functions and operators that can be used in formulas.

Command: **Field Attributes**                      Menu: Edit

Use: Database command. Specifies field names and characteristics.

Command: **Field Format**                              Menu: Edit

Use: Database command. Specifies the format and alignment of text and number fields.

Command: **Fill**                                      Menu: Range

Use: Worksheet command. Fills the specified worksheet range with the series of values that you define.

Command: **Find**                                      Menu: Search

Use: Word processing command. Locates specified text in the document, forward or back from cursor position.

Command: **Find Next**                              Menu: Search

Use: Word processing command. Locates next occurrence of text specified with the Find or Replace command.



**Command: Footer**

Menu: Format

Use: Word processing command. Defines text to appear at the bottom of each page in document.

**Command: Format**

Menu: Axis

Use: Graphics command. Specifies the format for numbers used as axis labels.

**Command: Format**

Menu: Range

Use: Worksheet command. Defines appearance of numbers and text in the selected area (right-aligned, left-aligned, centered, decimal places, etc.).

**Command: Freeze**

Menu: HotView

Use: Word processing command. Fixes the selected HotView in the document and breaks its link to the source document. Changes in the source document will no longer appear in the HotView.

**Command: Freeze All**

Menu: HotView

Use: Word processing command. Fixes all HotViews in a document and breaks their links to source documents.

**Command: Generate Document**

Menu: Report

Use: Database command. Produces a database report as a text document on disk. The document can be edited with the Jazz word processor or copied to other Macintosh programs.

**Command: Hang Up**

Menu: Commands

Use: Communications command. Breaks phone contact.

**Command: Header**

Menu: Format

Use: Word processing command. Defines text to appear at the top of each page in a document.

**Command: Hide Border**

Menu: Style

Use: Worksheet command. Removes labels from worksheet rows and columns.

**Command: Hide Grid**

Menu: Style

Use: Available in worksheets and databases. Removes grid lines from worksheets and databases.

Command: **Hide Record Numbers**      Menu: Style

Use: Database command. Removes record numbers from a database display.

Command: **Hide Ruler**      Menu: Format

Use: Word processing command. Hides all rulers in the active document.

Command: **Include**      Menu: HotView

Use: Word processing command. Inserts the worksheet, database, or graphics selection as a HotView in a document.

Command: **Insert**      Menu: Edit

Use: Available in worksheets and databases. Inserts new columns or rows between existing ones in a worksheet. Inserts new records or fields between existing ones in a database.

Command: **Insert Page Break**      Menu: Format

Use: Word processing command. Inserts a page break at the cursor position in a document.

Command: **Insert Ruler**      Menu: Format

Use: Word processing command. Inserts a ruler below the cursor position in a document.

Command: **Legend**      Menu: Style

Use: Graphics command. Defines symbols used in a graph and provides for explanatory text.

Command: **Line, Bar, & Area**      Menu: Type

Use: Graphics command. Specifies line, bar, or area graph.

These graphs have six plot options: Line, Bar, Overlapped Bar, Stacked Bar, Area, and Stock Market. Choose any of these from the Plot menu.

Command: **Lock**      Menu: Field

Use: Database Form command. Locks the selected field on a database form.

**Command: Merge Field**

Menu: HotView

Use: Word processing command. Inserts the database or worksheet selection at the cursor position in a document.

**Command: Modem**

Menu: Settings

Use: Communications command. Specifies the modem settings for communication with another computer.

**Command: Modify Form**

Menu: Edit

Use: Database Form command. Used to design and rearrange forms.

**Command: Name**

Menu: Range

Use: Worksheet command. Names worksheet ranges.

**Command: Names**

Menu: Query

Use: Database command. Lists the current query definitions for a database and is used to create new ones.

**Command: Names**

Menu: Report

Use: Database command. Lists the current report definitions for a database and is used to create new ones.

**Command: New**

Menu: File

Use: Displays Jazz icon box. To create a new Jazz document, double-click the appropriate application icon.

**Command: Open**

Menu: File

Use: Displays Jazz icon box and a list of documents for the current disk. To open a document, select it from the document list and click Open.

**Command: Open Cell**

Menu: Edit

Use: Places contents of the active cell into the edit box below the menu bar. Use standard Macintosh editing techniques to correct or modify cell contents.

**Command: Page**

Menu: HotView

Use: Word processing command. Inserts the current page number as a HotView at the cursor position in a document.

Command: **Page Setup**                      Menu: File

Use: Specifies page settings before printing: type of paper, header and footer, margins, etc.

Command: **Parse Settings**                  Menu: Edit

Use: Determines the column and row arrangement of material pasted into the worksheet or database from a word processor document, or received through the communications module.

Command: **Paste**                              Menu: Edit

Use: Copies contents of the Clipboard to the selected area in the active document.

In communications, Paste sends the contents of the Clipboard to the computer you're in contact with.

Command: **Paste Special**                    Menu: Edit

Use: Available only in worksheets. Provides special paste options for updating formulas with pasted values, transposing pasted values, and overlaying existing cell contents.

Command: **Patterns**                          Menu: Style

Use: Graphics command. Specifies patterns for area and bar plots.

Command: **Percent**                            Menu: Type

Use: Graphics command. Specifies percent graph as the graph type. Percent graphs have two plot options: Area and Stacked Bar.

Choose either from the Plot menu.

Command: **Pie**                                  Menu: Type

Use: Graphics command. Specifies pie chart as the graph type. Pie charts have two plot options: Pie Wedges and Pie. Choose either of these from the Plot menu.

Command: **Place**                              Menu: Field

Use: Database Form command. Copies the selected field name from a database to the anchor position on a form.

Command: **Point Labels**                      Menu: Plot

Use: Graphics command. Defines worksheet or database entries for use as labels in a graph plot.

- Command: **Preview** Menu: Report  
Use: Database command. Displays a screen version of the database report specified by the active report definition.
- Command: **Print** Menu: Report  
Use: Database command. Prints the database report specified by the current report definition.
- Command: **Print Current** Menu: File  
Use: Use Form command. Prints current record. Specifies the print quality and number of copies.
- Command: **Print Document** Menu: File  
Use: Prints entire active document. Specifies the print quality, page range, and number of copies.
- Command: **Print Merge** Menu: File  
Use: Word processing command. Prints worksheet ranges or database fields merged into a word processor document.
- Command: **Print Selection** Menu: File  
Use: Prints the selected area of the active document. Specifies the print quality, page range, and number of copies. Not included in the word processor, communications, or Modify Form portion of the database.
- Command: **Protection** Menu: Range  
Use: Available in worksheets. Protects specified worksheet cells from change; hides cell values; or checks entry format.
- Command: **Quit** Menu: File  
Use: Exits from the Jazz program to the Macintosh desktop.
- Command: **Recalc Settings** Menu: Range  
Use: Worksheet command. Determines the order of calculation.
- Command: **Recalculate** Menu: Range  
Use: Worksheet command. Calculates all worksheet formulas according to the Recalc settings that you specify.

Command: **Reference Board**                      Menu: Window

Use: Opens the Reference Board to display the name of the last active document, and database or worksheet selection, if any.

Command: **Replace**                              Menu: Search

Use: Word processing command. Locates and replaces text as specified.

Command: **Revert to Saved**                      Menu: File

Use: Replaces the active document with the version last saved.

Command: **Review Names**                      Menu: Range

Use: Worksheet command. Lists the range names (if any) for the active worksheet.

Command: **Save**                                  Menu: File

Use: Updates the current document on disk and in memory; the document remains open so that you can continue working with it.

Command: **Save As**                              Menu: File

Use: Saves the current document on disk under the name that you specify.

Command: **Scatter**                              Menu: Type

Use: Graphics command. Specifies scatter chart as the graph type. Scatter graphs have two plot options: X Data and Y Data. Choose either from the Plot menu.

Command: **Select All**                            Menu: Edit

Use: In a database: selects all records. In a worksheet: selects all cells in the active area. In graphics: selects the entire active graph.

Command: **Select with Criteria**                      Menu: Query

Use: Database command. Selects all the records that meet the active query criteria.

Command: **Send Answerback**                      Menu: Commands

Use: Communications command. Sends a message defined with the Set Answerback command.

- Command: Send Long Break**                      Menu: Commands  
Use: Communications command. Sends a long break signal to the computer you're in contact with.
- Command: Send Short Break**                      Menu: Commands  
Use: Communications command. Sends a short break signal to the computer you're in contact with.
- Command: Set Answerback**                      Menu: Settings  
Use: Communications command. Defines a status message sent by the Send Answerback command.
- Command: Set Distribution Ranges**              Menu: Tools  
Use: Worksheet command. Defines a range of values for a frequency distribution.
- Command: Set Fields**                              Menu: Sort  
Use: Database command. Specifies the sort fields and sort order for the records in a database.
- Command: Set File**                                Menu: Receive  
Use: Communications command. Specifies the document to receive data from another computer.
- Command: Set File**                                Menu: Send  
Use: Communications command. Identifies the document for transmission to another computer.
- Command: Set First Page**                      Menu: Format  
Use: Word processing command. Specifies the number of the first page in the document.
- Command: Set Labels**                            Menu: Axis  
Use: Graphics command. Specifies worksheet or database values to be used as text labels on a graph axis.
- Command: Set Page Break**                      Menu: Range  
Use: Worksheet command. Sets a page break above the selected row or at the left of the selected column.

Command: **Set Selection**                      Menu: Receive

Use: Communications command. Specifies the area in a document to receive data from another computer.

Command: **Set Selection**                      Menu: Send

Use: Communications command. Identifies the selection in a document for transmission to another computer.

Command: **Set Sort Ranges**                      Menu: Tools

Use: Worksheet command. Defines the sort order and range for the active worksheet.

Command: **Set Table Ranges**                      Menu: Tools

Use: Worksheet command. Defines a table that relates cells and formulas so that you can see how changes in cell values affect results.

Command: **Set Titles**                      Menu: Range

Use: Worksheet command. Keeps selected rows or columns visible at the edge of the worksheet while you scroll through other areas.

Command: **Show Attributes**                      Menu: Style

Use: Worksheet command. Shows the worksheet format and protection settings.

Command: **Show Definition**                      Menu: Query

Use: Database command. Displays the current query definition.

Command: **Show Definition**                      Menu: Report

Use: Database command. Displays the current database report definition.

Command: **Show Definitions**                      Menu: HotView

Use: Word processing command. Lists definitions of all HotViews in the active document.

Command: **Show Values**                      Menu: Style

Use: Worksheet command. Displays all cell contents for the active worksheet.

Command: **Size**                      Menu: Style

Use: Graphics command. Specifies the screen size of a graph and height and width in inches for printing.



Command: **Sort**

Menu: Sort

Use: Database command. Sorts all records in the database as specified with the Set Fields command.

Command: **Sort**

Menu: Tools

Use: Worksheet command. Sorts worksheet data as specified in Set Sort Ranges.

Command: **Start**

Menu: Receive

Use: Communications command. Starts the receipt of data from another computer to the selected document or portion of the document.

Command: **Start**

Menu: Send

Use: Communications command. Transmits the document specified with Set File command or portion selected with Set Selection command.

Command: **Stop**

Menu: Receive

Use: Communications command. Stops the receipt of data from another computer.

Command: **Terminal**

Menu: Settings

Use: Communications command. Sets the Macintosh terminal characteristics for communication with another computer.

Command: **Time**

Menu: HotView

Use: Word processing command. Inserts the current time as a Hot-View at the cursor position in a document.

Command: **Undo**

Menu: Edit

Use: Reverses the previous action and restores the document as it had been. Undo is turned on and off from the Apple menu.

Command: **Unlock**

Menu: Field

Use: Database Form command. Unlocks the selected field on a database form.

Command: **Use Form**

Menu: Edit

Use: Database Form command. Uses a form to locate, review, and edit database records.

**Command: View All Records**                      **Menu: Query**

**Use:** Database Form command. Selects all records in the database displayed individually on a database form.

**Command: View Horizontal**                      **Menu: Type**

**Use:** Graphics command. Rotates axes 90 degrees, so that the horizontal axis becomes vertical.

**Command: View Matching Records**                      **Menu: Query**

**Use:** Database Form command. Displays the first record that matches the current query criteria.

**Command: View Vertical**                      **Menu: Type**

**Use:** Graphics command. Rotates axes 90 degrees, so that the vertical axis becomes horizontal.

**Command: Zoom Down**                      **Menu: Window**

**Use:** Reduces the enlarged window to its previous size. Alternates with Zoom Up.

**Command: Zoom Up**                      **Menu: Window**

**Use:** Enlarges the active window to completely fill the screen. Alternates with Zoom Down.

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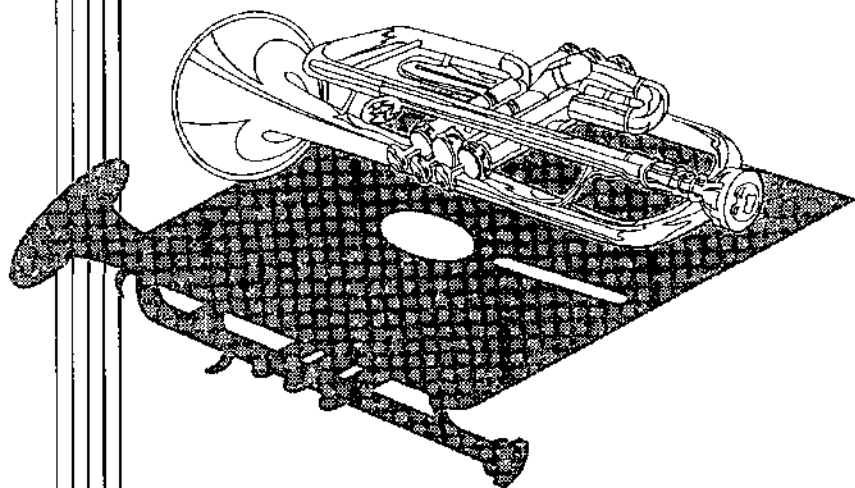
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# ***WORKSHEET AND DATABASE FUNCTIONS***

# B

**I****NTRODUCTION** This appendix defines all of the functions and constants used by the worksheet and database modules of Jazz. For full descriptions of each function, see the database report and worksheet chapters.

In these definitions, *x* can stand for a value, a cell reference, in some cases a range of cells, or a logical expression. The *n* stands for a number that you provide. A string is a series of text characters (as opposed to numbers). A value is a numeric entry. The value can be the result of a function or constant, a 1 (for true) or 0 (for false) resulting from a logical expression, or a time or date expressed as a serial number. (A text cell has a value of zero.) An attribute is the way in which a cell is displayed or formatted. A range is a highlighted single cell or group of highlighted cells on a worksheet or database. A field is a column of entries in a database.

ABS(x)—Absolute Value  
ACOS(x)—Arccosine of x  
ASIN(x)—Arcsine of x  
ATAN(x)—Arctangent of x  
ATAN2(x,y)—Four-Quadrant Arctangent  
AVG(range)—Average Value  
CELL(attribute,cell)—Cell Attributes  
CELLPOINTER(attribute)—Cell Attributes  
CHAR(number)—Character Code Conversion  
CHOOSE(n,delimited list)—Choose *n*th Element from List  
CLEAN(cell)—Remove Control Codes  
CODE(character)—Character Code Conversion  
COLS(range)—Column Count  
COS(x)—Cosine of Angle x  
COUNT(range)—Count Cells in Range  
CPYSGN(x,y)—Copy x with Sign of y  
DATE(year,month,day)—Date Value  
DATEVALUE("text")—Date Value  
DAVG(input range,column,criteria range)—Defined Range Average  
DAY(value)—Date Value Conversion  
DCOUNT(input range,column,criteria range)—Data Range Cell Count  
DMAX(input range,column,criterion range)—Data Range Maximum  
DMIN(input range,column,criterion range)—Data Range Minimum  
DSTD(input range,column,criterion range)—Data Range Standard Deviation  
DSUM(input range,column,criterion range)—Data Range Summation  
DVAR(input range,column,criterion range)—Data Range Variance  
ERR—Special Entry  
EXACT(cell1,cell2)—Compare text cells  
EXP(x)—Natural Exponent

EXP1(x)—Natural Exponent  $-1$   
 EXP2(x)—Powers of Two  
 FALSE—Logical Constant  
 FAVG(*field*)—Average Entries in Report Field  
 FCOUNT(*field*)—Count Entries in Report Field  
 FIND("text",*cell*,*offset*)—Find Text  
 FIXED(x,*digits*)—Numeric to Text Conversion  
 FMAX(*field*)—Find Maximum Entry in Report Field  
 FMIN(*field*)—Find Minimum Entry in Report Field  
 FPAGE—Current Report Page Number  
 FPREV—Previous Report Definition Cell Value  
 FSTD(*field*)—Standard Deviation of Entries in Report Field  
 FSUM(*field*)—Sum Entries in Report Field  
 FV(*payment*,*interest rate*,*term*)—Future Value  
 FVAR(*field*)—Variance in Report Field  
 HLOOKUP(*selection*,*table range*,*row offset*)—Horizontal Table Lookup  
 HOUR(*value*)—Time Value Conversion  
 IF(*condition*,*then*,*else*)—If-then Function  
 IRR(*estimate*,*range*)—Internal Rate of Return  
 INDEX(*range*,*column*,*row*)—Retrieve Cell Value  
 INT(x)—Integer Value  
 ISBLANK(*cell*)—Check Cell Contents for Blank Entry  
 ISERR(*cell*)—Check Cell Contents for ERR Entry  
 ISNA(*cell*)—Check Cell Contents for NA Entry  
 ISNUMBER(*cell*)—Check Cell Contents for Number Entry  
 ISREF(*cell*)—Check Cell Contents for REF Entry  
 ISSTRING(*cell*)—Check Cell Contents for Text Entry  
 LEFT(*cell*,*n*)—Extract the First *n* Characters  
 LENGTH(*cell*)—Number of Characters in Cell  
 LN(x)—Natural Logarithm  
 LN1(x)—Natural Logarithm  $+ 1$

LOG(*x*)—Common Logarithm  
LOWER(*cell*)—Change Case to Lower  
MAX(*range*)—Maximum Value in Range  
MIN(*range*)—Minimum Value in Range  
MINUTE(*value*)—Time Value Conversion  
MOD(*x*,*base*)—Modulo, or Remainder, of *x*  
MONTH(*value*)—Date Value Conversion  
N(*range*)—Top Left Cell Numeric Value  
NA—Special Entry  
NOW—Present Date and Time Value  
NPV(*interest*,*range*)—Net Present Value  
PI—Value of  $\pi$   
PMT(*principal*,*interest rate*,*term*)—Loan Payment  
PROPER(*cell*)—Change Case to Initial Upper  
PV(*payment*,*interest rate*,*term*)—Present Value  
RAND—Random Number  
REPEAT(*cell*,*n*,*times*)—Repeat Text  
REPLACE(*cell*,*position*,*delete n*,*"new text"*)—Replace Text  
RIGHT(*cell*,*n*)—Extract *n* Character from the Right  
ROUND(*x*,*n*)—Round *x* to *n* Places  
ROWS(*range*)—Row Count  
S(*range*)—Top Left Cell String Value  
SCALE(*x*,*n*)—Scale *x* to the Power of *n*  
SECOND(*value*)—Time Value Conversion  
SIN(*x*)—Sine of Angle *x*  
SQRT(*x*)—Square Root of *x*  
STD(*range*)—Standard Deviation  
SUBSTR(*cell*,*offset*,*n*)—Extract Text within String  
SUM(*range*)—Summation  
TAN(*x*)—Tangent of Angle *x*  
TIME(*hour*,*minute*,*second*)—Time Value



TIMEVALUE("text")—Time Value

TRIM(cell)—Remove Leading and Trailing Spaces

TRUE—Logical Constant

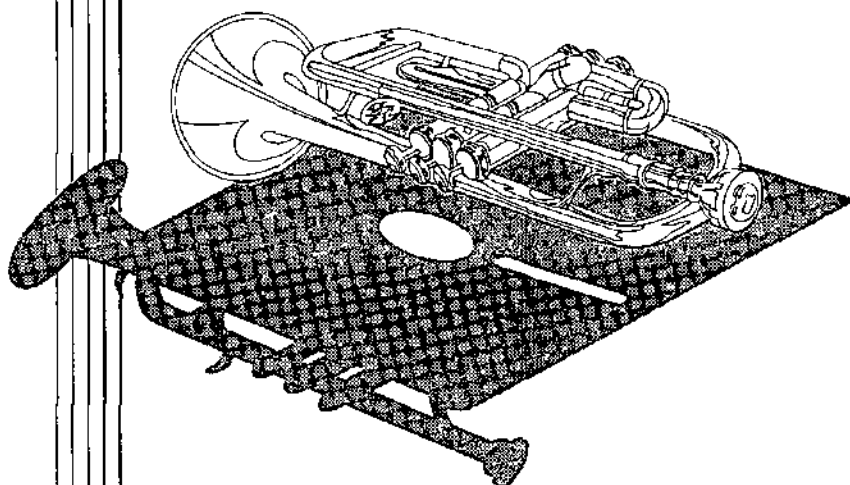
UPPER(cell)—Change Case to Upper

VALUE(cell)—Text to Numeric Conversion

VAR(range)—Population Variance

VLOOKUP(selection,table range,column offset)—Vertical Table  
Lookup

YEAR(value)—Date Value Conversion



---

# ***KEYBOARD COMMANDS***

# C

---

**INTRODUCTION** Many menu commands can also be typed at the keyboard. These keyboard equivalents are shown on individual menus and printed together here for convenience. To give a keyboard command, hold down the Control key [ ⌘ ] and type the appropriate letter.

## **K**eyboard Commands: All Jazz Modules ---

### **WINDOW MENU**

|           |     |                                      |
|-----------|-----|--------------------------------------|
| Zoom Up   | ⌘ W | Enlarges active window               |
| Zoom Down | ⌘ W | Reduces active window to normal size |

### **STYLE MENU**

|            |     |   |
|------------|-----|---|
| Plain Text | ⌘ P | Changes selected text to standard style |
| Bold       | ⌘ B | Boldfaces selected text                 |
| Italic     | ⌘ I | Italicizes selected text italics.       |
| Underline  | ⌘ U | Underlines selected text                |
| Outline    | ⌘ O | Outlines selected text                  |
| Shadow     | ⌘ S | Shadows selected text                   |

## **D**atabase Keyboard Commands ---

### **EDIT MENU**

|                    |     |  |
|--------------------|-----|--|
| Undo               | ⌘ Z | Cancels previous action  |
| Cut                | ⌘ X | Removes contents of selected area and places them on the Clipboard       |
| Copy               | ⌘ C | Copies selected area onto the Clipboard                                  |
| Paste              | ⌘ V | Pastes contents of the Clipboard into selected area in the active window |
| Select All Records | ⌘ A | Selects each record in the database                                      |
| Insert             | ⌘ I | Inserts a new field or a blank record                                    |
| Add Record         | ⌘ N | Adds a new blank record after the last record in the database            |
| Open Cell          | ⌘ O | Copies contents of the active cell to the entry box for editing          |

### **QUERY MENU**

|                      |     |  |
|----------------------|-----|--|
| Select with Criteria | ⌘ Q | Selects all database records that match current query criteria |
|----------------------|-----|--|

**STYLE MENU**

|            |     |                                |
|------------|-----|--------------------------------|
| Plain Text | ⌘ P | Changes text to standard style |
| Bold       | ⌘ B | Boldfaces text                 |
| Italic     | ⌘ I | Italicizes text                |
| Underline  | ⌘ U | Underlines text                |
| Outline    | ⌘ O | Outlines text                  |
| Shadow     | ⌘ S | Shadows text                   |

## Worksheet Keyboard Commands

**EDIT MENU**

|            |     |  |
|------------|-----|--|
| Undo       | ⌘ ⌘ | Cancels previous action  |
| Cut        | ⌘ X | Removes contents of selected area and places them on the Clipboard   |
| Copy       | ⌘ C | Copies selected area onto the Clipboard  |
| Paste      | ⌘ V | Pastes contents of the Clipboard into selected area of the worksheet   |
| Select All | ⌘ A | Selects the worksheet's active area—the smallest rectangle formed by cell A1 and all cells with entries, display formats, or protection settings |
| Insert     | ⌘ I | Inserts rows or columns at selected area   |
| Open Cell  | ⌘ O | Copies contents of the active cell to the entry box for editing  |

**RANGE MENU**

|             |     |                                     |
|-------------|-----|-------------------------------------|
| Recalculate | ⌘ R | Recalculates all worksheet formulas |
|-------------|-----|-------------------------------------|

**STYLE MENU**

|            |     |  |
|------------|-----|--|
| Plain Text | ⌘ P | Changes the entire worksheet into standard style |
|------------|-----|--|

|           |     |                 |
|-----------|-----|-----------------|
| Bold      | ⌘ B | Boldfaces text  |
| Italic    | ⌘ I | Italicizes text |
| Underline | ⌘ U | Underlines text |
| Outline   | ⌘ O | Outlines text   |
| Shadow    | ⌘ S | Shadows text    |

## **G**raphics Keyboard Commands ---

### **EDIT MENU**

|            |     |   |
|------------|-----|---|
| Undo       | ⌘ Z | Cancels previous action   |
| Cut        | ⌘ X | Removes data from the notation box or legend entry and places them on the Clipboard |
| Copy       | ⌘ C | Copies data from the notation box or legend entry onto the Clipboard                |
| Paste      | ⌘ V | Pastes data from the Clipboard to the notation box or legend entry                  |
| Select All | ⌘ A | Selects the entire graph  |

### **STYLE MENU**

|            |     |   |
|------------|-----|---|
| Plain Text | ⌘ P | Changes selected text to standard style |
| Bold       | ⌘ B | Boldfaces selected text                 |
| Italic     | ⌘ I | Italicizes selected text                |
| Underline  | ⌘ U | Underlines selected text                |
| Outline    | ⌘ O | Outlines selected text                  |
| Shadow     | ⌘ S | Shadows selected text                   |

## **W**ord Processing Keyboard Commands ---

### **EDIT MENU**

|      |     |   |
|------|-----|---|
| Undo | ⌘ Z | Cancels previous action                                       |
| Cut  | ⌘ X | Removes data from the document and places it on the Clipboard |

|            |     |   |
|------------|-----|---|
| Copy       | ⌘ C | Copies data from the document to the Clipboard                                |
| Paste      | ⌘ V | Replaces the current selection in the document with contents of the Clipboard |
| Select All | ⌘ A | Selects the entire document   |

#### **SEARCH MENU**

|           |     |   |
|-----------|-----|---|
| Find Next | ⌘ F | Locates next occurrence of the text specified in the Find or Replace window |
|-----------|-----|---|

#### **STYLE MENU**

|            |     |   |
|------------|-----|---|
| Plain Text | ⌘ P | Changes selected text to standard style |
| Bold       | ⌘ B | Boldfaces selected text                 |
| Italic     | ⌘ I | Italicizes selected text                |
| Underline  | ⌘ U | Underlines selected text                |
| Outline    | ⌘ O | Outlines selected text                  |
| Shadow     | ⌘ S | Shadows selected text                   |

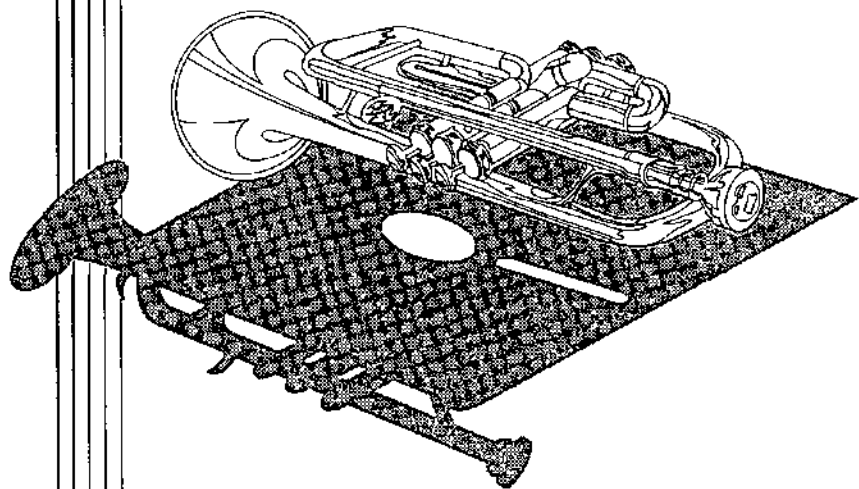
## **C**ommunications Keyboard Commands ---

#### **EDIT MENU**

|            |     |   |
|------------|-----|---|
| Copy       | ⌘ C | Places a copy of the selection on the Clipboard |
| Paste      | ⌘ V | Transmits text on the Clipboard                 |
| Select All | ⌘ A | Selects the entire screen                       |

#### **COMMANDS MENU**

|         |     |                                      |
|---------|-----|--------------------------------------|
| Dial    | ⌘ D | Dials specified number automatically |
| Hang Up | ⌘ H | Ends the call and hangs up.          |



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## ***SPECIAL EFFECTS***





**I****NTRODUCTION** Jazz and Macintosh work perfectly together to give visual impact to reports and presentations. This appendix shows a standard typed page and its "jazzed up" version. The information in each page is much the same. But it's obscured in the typed version and is harder to decipher. The graphics and layout of the Jazz version have a completely different effect. They communicate clearly and quickly.

WIDGECO INC.

Sales Performance Report

Average sales figures per salesperson by region were:

|           |           |
|-----------|-----------|
| East      | \$338,928 |
| West      | \$355,412 |
| Central   | \$444,568 |
| Europe    | \$381,787 |
| Pacific   | \$431,694 |
| Corporate | \$390,478 |

The following figures show the contribution of each region to the corporate sales total:

|         |             |     |
|---------|-------------|-----|
| East    | \$4,067,140 | 21% |
| West    | \$4,620,360 | 24% |
| Central | \$5,334,820 | 27% |
| Europe  | \$2,290,720 | 12% |
| Pacific | \$3,021,860 | 16% |

This year's performance met or exceeded goals in all Sales Regions. Performance ratios ranged from 100% in the Eastern Region to 106% in Europe. These results represent both an actual increase in sales and improved ratios relative to last year.

Demand for WidgeCo products was influenced by several factors this year. The first quarter saw the opening of two new plants by competitors in the Far East. The effects were not fully felt until the second quarter when our Pacific region orders began to decline. The effect for the year is shown in the Performance Ratio for the Pacific region which, at 100%, is the lowest; nevertheless, the Pacific region achieved its goals for the year.

At the other end of the scale, our new A-line widgets proved quite successful in Europe. Price reductions resulting from modernization of our Irish manufacturing facilities gave us modest access to new East European markets. Our European sales staff is optimistic that we can develop these markets significantly in the

WIDGECO INC.

Sales Performance Report

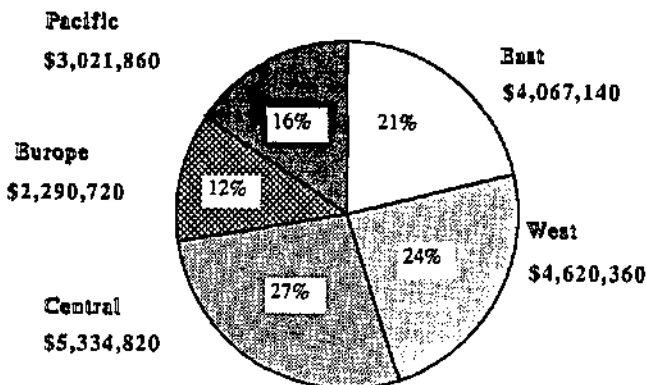
|           |              |      |
|-----------|--------------|------|
| Corporate | \$19,334,900 | 103% |
|-----------|--------------|------|

Average sales figures per salesperson by region were:

|         |           |
|---------|-----------|
| East    | \$338,928 |
| West    | \$355,412 |
| Central | \$444,568 |
| Europe  | \$381,787 |
| Pacific | \$431,694 |

|           |           |
|-----------|-----------|
| Corporate | \$390,478 |
|-----------|-----------|

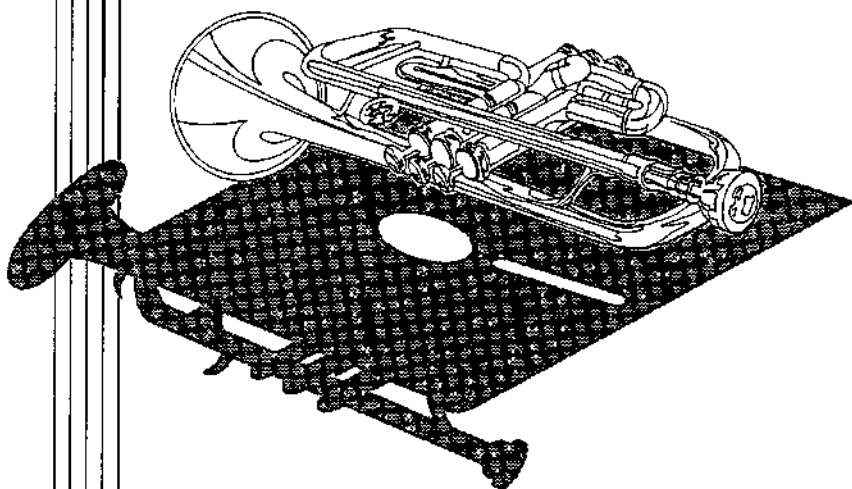
The following chart shows the contribution of each region to the corporate sales total:



### Regional Sales, 1st Half 1985

This year's performance met or exceeded goals in all Sales Regions. Performance ratios ranged from 100% in the Eastern Region to 106% in Europe. These results represent both an actual increase in sales and improved ratios relative to last year.

July 1985



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# **ASCII TABLES**

A large, bold, black letter 'E' in a serif font, positioned on the right side of the page. A horizontal line extends from the left edge of the page to the base of the 'E'.

**INTRODUCTION** This appendix contains  
ASCII codes for Macintosh characters in the Monaco,  
Chicago, Geneva, and New York fonts.

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| 2    | 34 ^  | 66 B | 98 b  |
| 3    | 35 *  | 67 C | 99 c  |
| 4    | 36 \$ | 68 D | 100 d |
| 5    | 37 %  | 69 E | 101 e |
| 6 □  | 38 &  | 70 F | 102 f |
| 7 □  | 39 '  | 71 G | 103 g |
| 8 □  | 40 (  | 72 H | 104 h |
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| 10 □ | 42 *  | 74 J | 106 j |
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| 12 □ | 44 ,  | 76 L | 108 l |
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| 15 □ | 47 /  | 79 O | 111 o |
| 16 □ | 48 0  | 80 P | 112 p |
| 17 □ | 49 1  | 81 Q | 113 q |
| 18 □ | 50 2  | 82 R | 114 r |
| 19 □ | 51 3  | 83 S | 115 s |
| 20 □ | 52 4  | 84 T | 116 t |
| 21 □ | 53 5  | 85 U | 117 u |
| 22 □ | 54 6  | 86 V | 118 v |
| 23 □ | 55 7  | 87 W | 119 w |
| 24 □ | 56 8  | 88 X | 120 x |
| 25 □ | 57 9  | 89 Y | 121 y |
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| 129 Å | 161 ° | 193 i   | 225 □ |
| 130 Ç | 162 ¢ | 194 ı   | 226 □ |
| 131 É | 163 £ | 195 ✓   | 227 □ |
| 132 Ñ | 164 § | 196 f   | 228 □ |
| 133 Ò | 165 • | 197 ≈   | 229 □ |
| 134 Ù | 166 ¤ | 198 Δ   | 230 □ |
| 135 á | 167 ß | 199 «   | 231 □ |
| 136 â | 168 © | 200 »   | 232 □ |
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### ABOUT THE AUTHORS:

Joseph Caggiano is an author, teacher, and consultant who currently manages the editorial department of a software publishing firm. He is also the author of *The Easy Guide to Your Macintosh* from SYBEX.

Michael McCarthy is the news editor for *InfoWorld* magazine and has written numerous articles for other microcomputer magazines. He teaches courses on microcomputer use for small businesses.

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